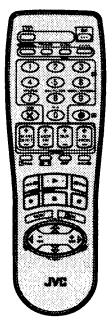
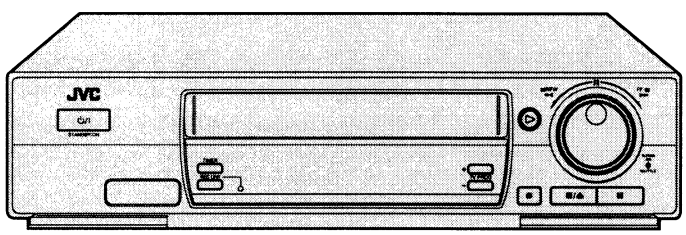
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J668EU/J711EU/J768EU





SHOWVIEW®

Hi-Fi

VHS PAL

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J768EU)*

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	
Power on	: 20 W
Power off	: 5 W
Power save	: 2.8 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 281 mm
Weight	: 3.5 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
Recording system	: DA4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz (Normal audio) 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: 21-pin scart connectors : IN/OUT x 1, IN/DECODER x 1 RCA connector: AUDIO OUT x 1

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470MHz UHF 470 – 862MHz
Aerial output	: UHF channels 22 – 69 (Adjustable)
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

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The following table lists the differing points between Models (HR-J668EU, HR-J711EU and HR-J768EU) in this series.

	HR-J668EU	HR-J711EU	HR-J768EU
FRONT PANEL COLOUR	BLACK	SILVER	SILVER
JOG/SHUTTLE	NOT USED	NOT USED	USED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

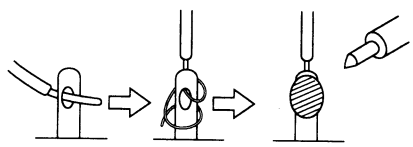


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

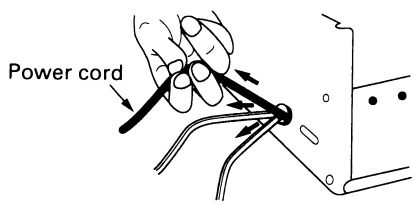


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

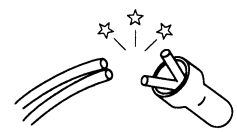


Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

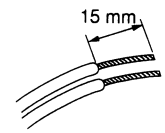


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

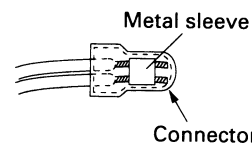


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

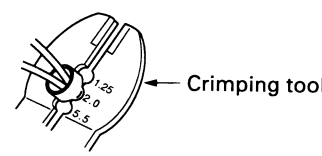


Fig.6

(5) Check the four points noted in Fig.7.

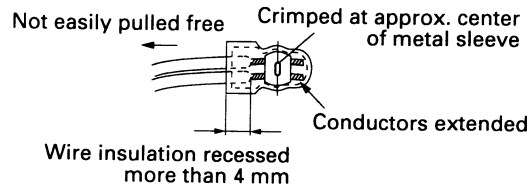

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

INSTRUCTIONS [This instruction manual is for HR-J768EU.]

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

WARNING: DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION
- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

WARNING

There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in Eastern European countries (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

For Italy:

"It is declared that this product, brand JVC, conforms to the Ministry Decree n. 548 of 28 Aug.'95 published in the Official Gazette of the Italian Republic n. 301 of 28 Dec.'95"

The STANDBY/ON ⏻/I button does not completely shut off mains power from the unit, but switches operating current on and off. " ⏻ " shows electrical power standby and " I " shows ON.

IMPORTANT
- Please read the various precautions on this page before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

Failure to heed the following precautions may result in damage to the recorder, remote control or video cassette.

1. **DO NOT place the recorder . . .**
   ... in an environment prone to extreme temperatures or humidity.
   ... in direct sunlight.
   ... in a dusty environment.
   ... in an environment where strong magnetic fields are generated.
   ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the recorder's ventilation openings.**
3. **DO NOT place heavy objects on the recorder or remote control.**
4. **DO NOT place anything which might spill on top of the recorder or remote control.**
5. **AVOID violent shocks to the recorder during transport.**

MOISTURE CONDENSATION

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

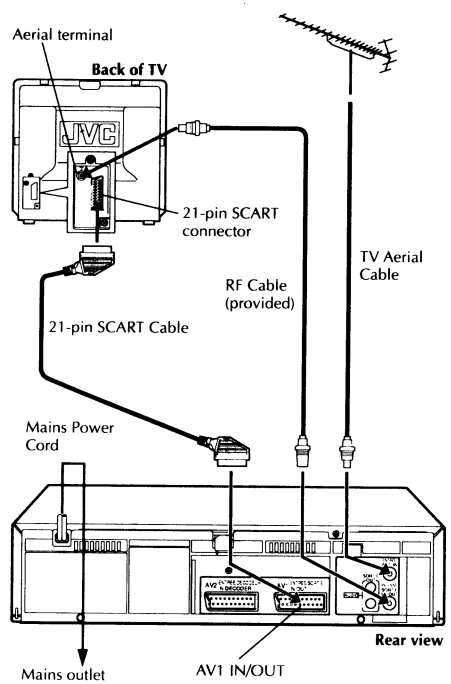
ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

VHS PAL HQ SHOWVIEW®

- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder, however, only VHS signals can be played back and recorded.
- HQ VHS is compatible with existing VHS equipment.
- SHOWVIEW is a registered trademark of Gemstar Development Corporation. The SHOWVIEW system is manufactured under licence from Gemstar Development Corporation.

Basic Connections



Make AV connection if your TV has a 21-pin AV input connector (SCART) in order to reduce the possibility of interference. And if you are using a stereo TV, you will need this cable in order to enjoy stereo playback of videotapes.

It's essential that your video recorder be properly connected. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

1 CHECK CONTENTS

Make sure the package contains all of the accessories listed in "Specifications" (☞ pg. 55).

2 SITUATE RECORDER

Place the recorder on a stable, horizontal surface.

3 CONNECT RECORDER TO TV

The connection method you use depends on the type of TV you have.

RF CONNECTION
- *To Connect To A TV With NO AV Input Terminals . . .*
  - **a–** Disconnect the TV aerial cable from the TV.
  - **b–** Connect the TV aerial cable to the ANT. IN jack on the rear panel of the recorder.
  - **c–** Connect the provided RF cable between the RF OUT jack on the rear panel of the recorder and the TV's aerial terminal.

AV CONNECTION
- *To Connect To A TV With AV Input Terminals . . .*
  - **a–** Connect the aerial, recorder and TV as per "RF CONNECTION".
  - **b–** Connect an optional SCART cable between the AV1 IN/OUT socket on the rear panel of the recorder and the TV's 21-pin SCART connector.

4 CONNECT RECORDER TO MAINS

Plug the end of the mains power cord into a mains outlet.

After you plug the mains power cord into a mains outlet, the Country Set display appears on the TV screen and/or on the recorder's front display panel when the ⏻/I button on the recorder/remote control is pressed for the first time to power on the recorder; go to page 4 to perform Auto Set Up.

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

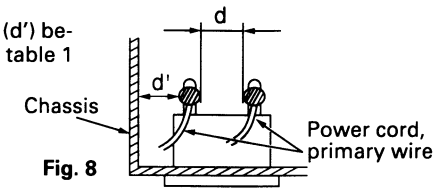


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method : (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

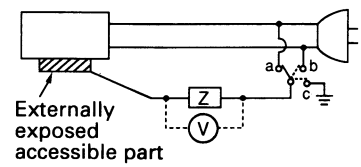


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

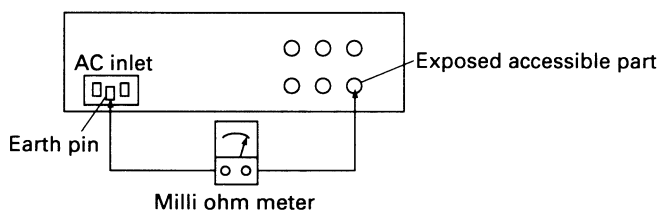


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

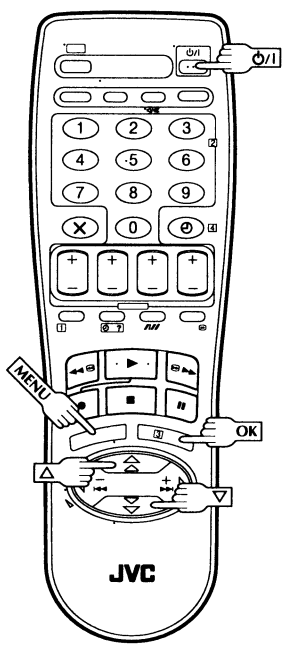
Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Preset Download

You can use this function only with the TV offering T-V Link, etc.*

** Compatible with TVs offering T-V Link, EasyLink, Megalogic, SMARTLINK, Q-Link, DATA LOGIC or NEXTVIEWLINK via fully-wired 21-pin SCART cable. The degree of compatibility and available functions may differ by system.*



NOTES:

- *In the area where no TV station transmits a PDC signal, the recorder can perform neither auto clock set nor auto Guide Program number set.*
- *If there is a power cut, or if you press ⏻/I or **MENU** while downloading or set up is in progress, it will be interrupted; be sure to turn off the recorder power once and try again from the beginning.*
- *Auto clock may not function properly depending on the reception condition.*
- *When you perform T-V LINK function, be sure to use fully-wired 21-pin SCART cable.*
- *On this recorder, the characters available for station's name (ID) are A–Z, 0–9, –, ✱, + and ␣ (space). Some downloaded station's name may differ from those of your TV (☞ pg. 41).*

When you connect the recorder and your TV via fully-wired 21-pin SCART cable (☞ pg. 3), you can set the recorder's tuner channels by downloading preset data from your TV instead of using the Auto Set Up function (☞ pg. 4). After downloading is completed, the recorder sets the clock and Guide Program number automatically. For details, refer to the instruction manual for your TV.

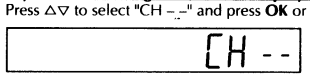
Perform steps **1** to **3** of "Auto Set Up" on page 4 and 5 before continuing.

1 PERFORM PRESET DOWNLOAD

Press **OK**.

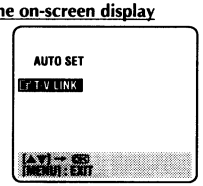
If you are referring to the front display panel

Press △▽ to select "CH –␣" and press **OK** or ▷.



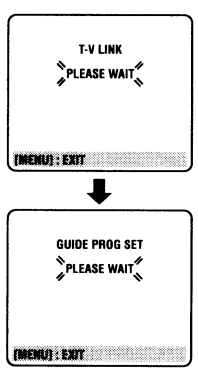
If you are referring to the on-screen display

Press △▽ to move the highlight bar (pointer) to "T-V LINK" and press **OK** or ▷.



Preset position on the display panel increases from "CH1"; do NOT press any button on the recorder or remote control until the display panel shows either the display as illustrated on page 7 or "– –:– –".

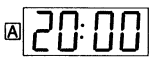
- If "– –:– –" appears on the display panel, refer to page 7.
- If you are using the on-screen display, the T-V LINK screen will appear. Then the GUIDE PROG SET screen will appear during Guide Program number set.
- If you press any button on the recorder or remote control while downloading is in progress, it will be interrupted.



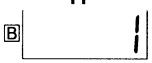
2 SET VIDEO CHANNEL

Set the Video Channel to off manually. (☞ pg. 45)

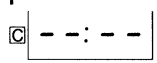
Results of Auto Set Up/Preset Download appear on the front display panel

Ⓐ 

When both auto channel set and auto clock set have been completed successfully the correct current time will be displayed after the **OK** button is pressed in step **6** on page 5 or in step **1** on page 6.

Ⓑ 

When auto channel set has been completed successfully but auto clock set has not, "1" (channel position) will be displayed after the **OK** button is pressed in step **6** on page 5 or in step **1** on page 6.

Ⓒ 

When neither auto channel set nor auto clock set has been completed successfully, "– –:– –" will be displayed.

You can check if the Guide Program numbers have been set correctly when you perform SHOWVIEW Timer Programming (☞ pg. 24); if the correct channel position number is displayed in step **3**, this confirms that the Guide Program number for the SHOWVIEW number you enter in step **2** has been set correctly.

Ⓐ If both auto channel set and auto clock set have been performed successfully:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).
- If station names (ID — ☞ pg. 43) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds when the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change channel positions, or to set or change station names, see pages 40 – 44.

Ⓑ If auto channel set has succeeded but auto clock set has not:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG** button(s).
- If station names (ID — ☞ pg. 43) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds when the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change channel positions, or to set or change station names, see pages 40 – 44.

2 Perform "Clock Set" on page 46.

Ⓒ If both auto channel set and auto clock set have failed:

1 Make sure the TV aerial cable is connected properly to the recorder and turn off the recorder power once, then turn the recorder power back on again.
- The Country Set display appears on the front display panel and/or on the screen; perform steps **2** – **6** on pages 4 – 5 again or perform the procedure on page 6.

IMPORTANT

- In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using SHOWVIEW, the recorder will record a TV programme of a different station. When programming the timer using SHOWVIEW, be sure to check whether the channel position on which your recorder receives the broadcasting station you wish to record is selected (☞ pg. 24, "SHOWVIEW Timer Programming").
- Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations with an unacceptable picture ☞ "Delete A Channel" on page 41.
- **For RF connection users:** In certain reception conditions, the Video Channel may not be set correctly and interference may appear in the TV picture while the recorder's power is on. Set your Video Channel manually. ☞ pg. 45, "Video Channel Set".

INFORMATION

Language for the on-screen display

Auto Set Up also selects the language automatically for the on-screen display depending on the Country setting you have made in step **2** on page 4 (unless you have selected BELGIUM or SUISSE), as shown below.

SUOMI	→ SUOMI	DANMARK	→ DANSK	NEDERLAND	→ NEDERLANDS
PORTUGAL	→ ENGLISH	ÖSTERREICH	→ DEUTSCH	GREECE	→ ENGLISH
DEUTSCHLAND	→ DEUTSCH	ČESKÁ REPUBLIKA	→ ČEŠTINA	OTHER WESTERN EUROPE	→ ENGLISH
POLSKA	→ POLSK	ITALIA	→ ITALIANO	OTHER EASTERN EUROPE	→ ENGLISH
NORGE	→ NORSK	MAGYARORSZÁG	→ MAGYAR		
SVERIGE	→ SVENSKA	ESPAÑA	→ CASTELLANO		

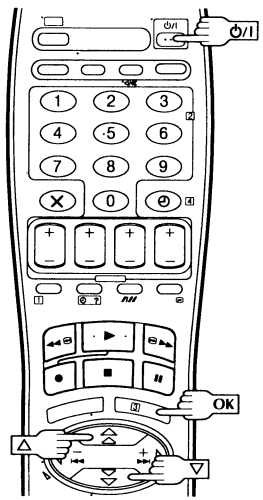
If you want to change the language setting manually, ☞ "Language" on page 8.

Just Clock

Your recorder is equipped with the Just Clock function which provides accurate time keeping through automatic adjustments at regular intervals, by reading data from a PDC signal. If you want to take advantage of this function, simply set it to "ON". ☞ "Just Clock" on page 46.

Auto Set Up

Auto Channel Set/Auto Clock Set/Auto Guide Program Number Set/Auto Video Channel Set



International Telephone Country Code

BELGIUM	: 32	NORGE	: 47
ČESKÁ REPUBLIKA	: 42	ÖSTERREICH	: 43
DANMARK	: 45	POLSKA	: 48
DEUTSCHLAND	: 49	PORTUGAL	: 351
ESPAÑA	: 34	SUISSE	: 41
GREECE	: 30	SUOMI	: 358
ITALIA	: 39	SVERIGE	: 46
MAGYARORSZÁG	: 36	OTHER WESTERN EUROPE	: - -
NEDERLAND	: 31	OTHER EASTERN EUROPE	: EE

ATTENTION

Once you have performed Auto Set Up, even if the recorder's memory backup has expired, all the stored stations and their Guide Program numbers remain in the recorder's memory and the recorder will not perform Auto Set Up again. You only need to set the clock. (☞ pg. 46)

If you have moved to a different area, perform each setting as required.

- Video Channel setting (for RF connection users) ☞ pg. 45
- Tuner setting ☞ pg. 38
- Clock setting ☞ pg. 46

If a new station starts broadcasting in your area, perform tuner setting (☞ pg. 38) and, if necessary, video channel setting (☞ pg. 45).

When the ⏻/I button on the recorder/remote control is pressed for the first time to power on the recorder after you plug the mains power cord into a mains outlet, the Country Set display will appear on the TV screen and the recorder's front display panel. By simply selecting your country*, the Auto Set Up function sets the tuner channels, clock**, Guide Program numbers and video channel*** automatically.

* If you live in Belgium (BELGIUM) or Switzerland (SUISSE), you also need to select your area.

** If you live in Hungary (MAGYARORSZAG), Czech Republic (CESKA REPUBLIKA), Poland (POLSKA) or other countries in Eastern Europe (OTHER EASTERN EUROPE), set the clock manually.

*** Useful if you have connected the video recorder to your TV via RF connection (☞ pg. 3). Video Channel (RF output channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.

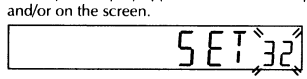
You can refer to the front display panel and/or the on-screen display to perform this procedure.

Before starting, make sure of the following:

- The TV aerial cable should be connected to the recorder.
- The recorder's mains power cord should be connected to a mains outlet. ☞ pg. 3
- If you want to use the on-screen display, the TV should be set to its AV mode (with AV connection ☞ pg. 3) or UHF channel 36 (with RF connection ☞ pg. 3).

1 TURN ON THE RECORDER

Press ⏻/I on the recorder or remote control. The Country Set display appears on the front display panel and/or on the screen.



NOTE:

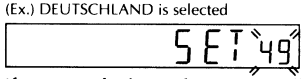
If you have connected your TV to the recorder with RF connection and the on-screen display appearing on UHF channel 36 looks distorted, perform this procedure referring to the front display panel.

2 SELECT COUNTRY

If you are referring to the front display panel

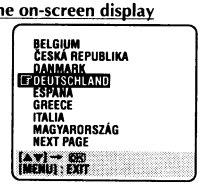
Press △▽ to select your international telephone country code of your country referring to the chart in the left column.

(Ex.) DEUTSCHLAND is selected



If you are referring to the on-screen display

Press △▽ to move the highlight bar (pointer) to your country's name.



NOTE:

*If you have selected BELGIUM (32) or SUISSE (41), go to step **3**. If you have selected MAGYARORSZAG (36), CESKA REPUBLIKA (42), POLSKA (48) or OTHER EASTERN EUROPE (EE), press **OK**. The Clock Set screen will appear. Set the clock manually (☞ pg. 46 – 47), then go to step **4**. If you have selected any other country name (code), go to step **4**.*

3 SELECT LANGUAGE

Press **OK**. The Language Set display appears on the front display panel and/or on the screen.

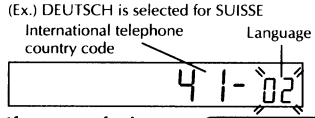
If you are referring to the front display panel

Press △▽ to select your language code.

Language Code

ENGLISH	: 01	NORSK	: 08
DEUTSCH	: 02	SUOMI	: 09
FRANCAIS	: 03	DANSK	: 10
ITALIANO	: 04	POLSKI	: 11
CASTELLANO	: 05	ČEŠTINA	: 12
NEDERLANDS	: 06	MAGYAR	: 13
SVENSKA	: 07		

(Ex.) DEUTSCH is selected for SUISSE



If you are referring to the on-screen display

Press △▽ to move the highlight bar (pointer) to the language of your choice.

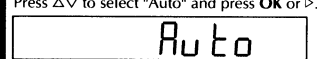
(Ex.) DEUTSCH is selected

4 PERFORM AUTO SET UP

Press **OK**.

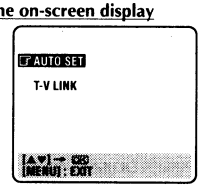
If you are referring to the front display panel

Press △▽ to select "Auto" and press **OK** or ▷.



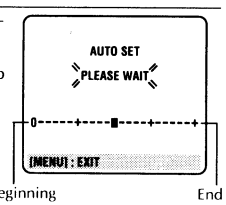
If you are referring to the on-screen display

Press △▽ to move the highlight bar (pointer) to "AUTO SET" and press **OK** or ▷.



"Auto" blinks on the display panel; do NOT press any button on the recorder or remote control until the display panel shows either the display as illustrated in step **5** or "– –:– –".

- If you are using the on-screen display, the AUTO SET screen will appear. As Auto Set Up progresses, the " ■ " mark on the screen moves from left to right.

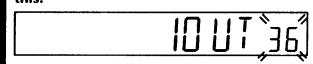


5 CONFIRM/SET VIDEO CHANNEL

If you have connected the video recorder to your TV via an RF cable only (RF connection)

The channel that is shown on the display panel is your Video Channel.

To view picture signals from the video recorder, set your TV to the Video Channel. — Refer to the instructions supplied with your TV set for how to do this.



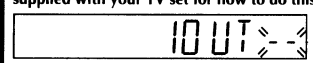
- If you have selected MAGYARORSZAG (36), CESKA REPUBLIKA (42), POLSKA (48) or OTHER EASTERN EUROPE (EE) in step **2** on page 4, "2OUT" appears in stead of "1OUT".

If you have connected the video recorder to your TV via both an RF cable and a 21-pin SCART cable (AV connection)

You do not need the video channel so you have to set the video channel to off.

Press **TV PROG** – until the display panel shows "1OUT– –" to set the Video Channel to off.

To view picture signals from the video recorder, set your TV to its AV mode. — Refer to the instructions supplied with your TV set for how to do this.



6 FINISH AUTO SET UP

Press **OK** and refer to page 7 to check the results.

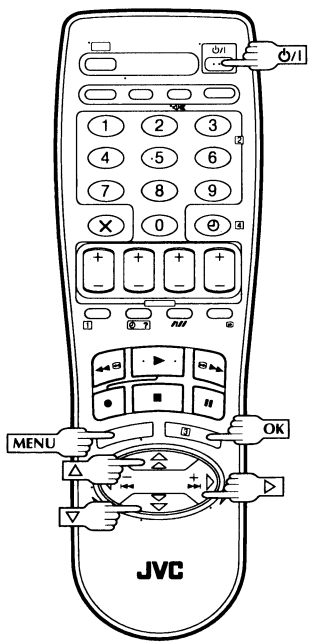
- If "– –:– –" appears on the display panel, refer to page 7.

NOTES:

- *Auto channel set function takes place first; it assigns automatically all receivable stations in your area.*
- *Auto clock set function sets the clock automatically by reading the clock setting data from a station transmitting a PDC signal while auto channel set is being performed.*
- *During auto channel set, the recorder recognizes each station name of the detected stations and stores them in the recorder's memory, then automatically sets SHOWVIEW assigned Guide Program number for those stations according to the broadcast area.*
- *In the area where no TV station transmits a PDC signal, the recorder can perform neither auto clock set nor auto Guide Program number set.*
- ***For RF connection users:** The video recorder detects the channels which are not occupied by local stations and selects one channel automatically for your Video Channel that is located in the middle of more than 5 vacant channels.*
- *If there is a power cut, or if you press ⏻/I or **MENU** while Auto Set Up is in progress, Auto Set Up will be interrupted; be sure to turn off the recorder power once and try again from step **1**.*
- *Auto clock may not function properly depending on the reception condition.*

Power Save Mode

Turn on the TV and select the VIDEO channel (or AV mode).



You can reduce the power consumption while the recorder is turned off.

1 TURN ON THE RECORDER

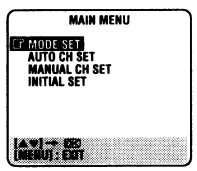
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

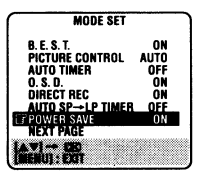
3 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



4 SELECT POWER SAVE MODE

Press △▽ to move the highlight bar (pointer) to "POWER SAVE", then press **OK** or ▷ to set to "ON".



5 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *During Power Save, the display panel will be turned off.*
- *The Just Clock function (☞ pg. 46) does not work while the Power Save mode is engaged.*
- *While the recorder is in the Power Save mode, the picture may be distorted momentarily when you turn on/off the recorder.*
- *Power Save does not work when ...*
  - *... the recorder is in the Timer mode.*
  - *... the recorder's power is turned off after timer-recording (or Instant Timer Recording).*
  - *... the Auto Satellite Prog Recording mode is engaged (☞ pg. 30).*
  - *... "AV2 SELECT" is set to "DECODER" or "SAT" (☞ pg. 33).*

T-V Link Functions

When you connect the recorder and your TV via fully-wired 21-pin SCART cable (☞ pg. 3), the following functions are available. You can use these functions only with the TV offering T-V Link, etc.*
For details, refer to the instruction manual for your TV.

** Compatible with TVs offering T-V Link, EasyLink, Megalogic, SMARTLINK, Q-Link, DATA LOGIC or NEXTVIEWLINK via fully-wired 21-pin SCART cable. The degree of compatibility and available functions may differ by system.*

NexTView Link

You can download the EPG (Electronic Programme Guide) information from your TV for timer-programming on the recorder.
For details, refer to the instruction manual for your TV.

TV Auto Power On

You can turn on the TV and set it to video mode automatically whenever you play a tape.
For details, refer to the instruction manual for your TV.

VCR Auto Standby

You can use your TV's remote control to turn off the recorder.
For details, refer to the instruction manual for your TV.

Direct Rec

You can start recording the programme that you are watching on your TV with simple operation. Press and hold **REC** and press **PLAY** on the remote control, or press **REC** on the recorder. Follow the procedure below to use this function.

1 TURN ON THE RECORDER

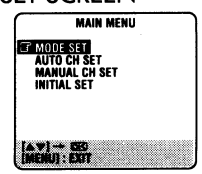
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

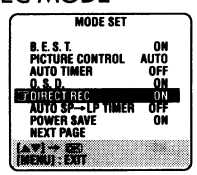
3 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



4 SELECT DIRECT REC MODE

Press △▽ to move the highlight bar (pointer) to "DIRECT REC", then press **OK** or ▷ to set to "ON".



5 RETURN TO NORMAL SCREEN

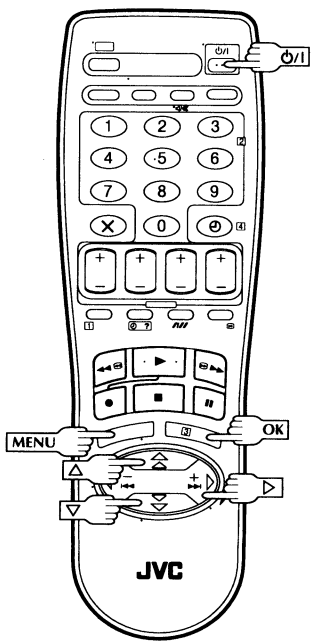
Press **MENU**.

NOTES:

- *If "DIRECT REC" is set to "OFF", the **REC** button functions as described in "Basic Recording" (☞ pg. 19).*
- *During the Direct Rec, "CH – –" appears on the display panel.*
- *When you perform T-V LINK functions, be sure to use the fully-wired 21-pin SCART cable.*

Language

Turn on the TV and select the VIDEO channel (or AV mode).



This recorder offers you the choice to view on-screen messages in 13 different languages. Though Auto Set Up selects the language automatically (☞ pg. 7), you can change the language setting manually using this procedure as required.

1 TURN ON THE RECORDER

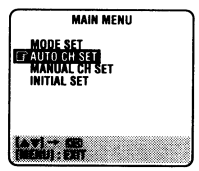
Press ⏻/I.

2 ACCESS MAIN MENU

Press **MENU**.

3 ACCESS COUNTRY SET SCREEN

Press △▽ to move the highlight bar (pointer) to "AUTO CH SET", then press **OK** or ▷.



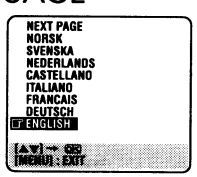
4 SELECT COUNTRY

Press △▽ to move the highlight bar (pointer) to your country's name, then press **OK** or ▷.

5 SELECT LANGUAGE

Press △▽ to move the highlight bar (pointer) to the language of your choice.

- You do not have to press **OK**; pressing **OK** enters Auto Set/T-V LINK screen.

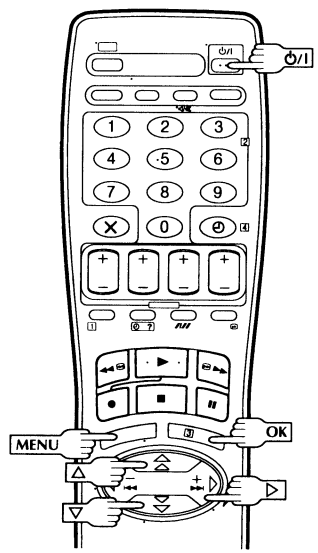


6 RETURN TO NORMAL SCREEN

Press **MENU**.

On-Screen Displays

Turn on the TV and select the VIDEO channel (or AV mode).



You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF. Messages appear in the selected language (☞ pg. 7 or 8).

1 TURN ON THE RECORDER

Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

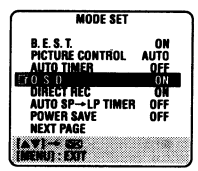
Press **MENU**.

3 ACCESS MODE SET SCREEN

Move the highlight bar (pointer) to "MODE SET" by pressing △▽, then press **OK** or ▷.

4 ENABLE/DISABLE ON-SCREEN DISPLAY

The default setting is "ON", so if you want on-screen displays, leave the setting as it is and go to step **5**. If you don't want the displays to appear, press △▽ to move the highlight bar (pointer) to "O.S.D." and press **OK** or ▷ to set "O.S.D." to "OFF".



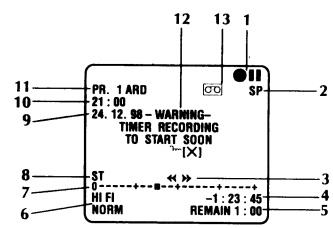
5 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

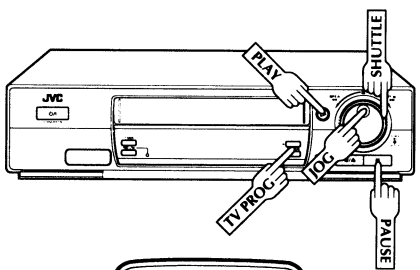
- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting.*
- *During playback, the operation mode indicators may be disturbed depending on the type of tape being used.*

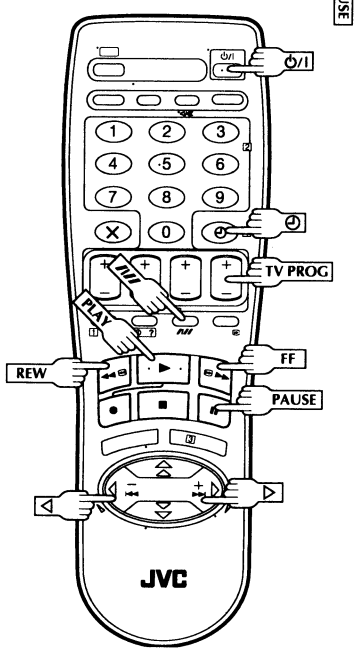
The superimposed indication on the TV screen tells you what the recorder is doing.



1– Operation mode indicators
2– Tape speed SP/LP/EP (EP is for NTSC playback only)
3– Tape direction
4– Counter display
5– Tape remaining time indicator (☞ pg. 20)
6– Audio mode display (☞ pg. 18)
7– Tape position indicator (☞ pg. 13)
8– Type of Broadcast (☞ pg. 21)
9– Current day/month/year
10– Clock display
11– Channel position number and station name/Aux. indicator (L-1 or L-2)
12– Timer warning display (☞ pg. 25, 27)
13– Cassette loaded mark

Playback Features



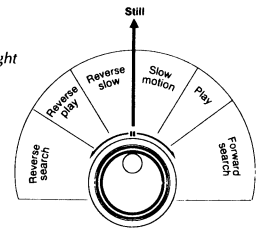


ATTENTION

In the search, still, slow-motion or frame-by-frame playback mode,
- the picture will be distorted.
- the noise bars will appear.
- there will be a loss of colour with an LP-recorded tape.

NOTE:

*Refer to the **SHUTTLE** ring illustration to the right as you read the following procedures.*



High-Speed Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring all the way to the right for forward high-speed search, or to the left for reverse high-speed search. Releasing **SHUTTLE** resumes still picture playback.

- For forward high-speed search, turn the **SHUTTLE** ring all the way to the right and release it within 1 second.
- For reverse high-speed search, turn the **SHUTTLE** ring all the way to the left and release it within 1 second.

OR

During playback or still, press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

To resume normal playback, press **PLAY**.

NOTE:

*For short searches, press and hold **FF** or **REW** for over 2 seconds during playback or still picture. When released, normal playback resumes.*

Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **TV PROG** buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Turn the **JOG** dial to the right for forward frame-by-frame playback, or to the left for reverse frame-by-frame playback.

OR

Press **PAUSE**.

OR

Press ◁ or ▷ (⏮ or ⏭).

To resume normal playback, press **PLAY**.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During playback or still, turn the **SHUTTLE** ring to the right for forward slow motion, or to the left for reverse slow motion (refer to the illustration on page 14).

OR

During still picture, press and hold **PAUSE** for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold ◁ or ▷ (⏮ or ⏭). Release to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring to the right for forward variable-speed search, or to the left for reverse variable-speed search (refer to the illustration on page 14).

OR

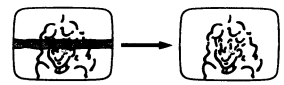
During playback, press ◁ or ▷ (⏮ or ⏭).

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

To resume normal playback, press **PLAY**.

Manual Tracking

Your video recorder is equipped with automatic tracking control. During playback, you can override this and adjust the tracking manually by pressing the **TV PROG** buttons.



1 OVERRIDE AUTOMATIC TRACKING

Press ▲/▼ on the remote to engage manual tracking.

2 ADJUST TRACKING MANUALLY

Press **TV PROG** + or – to adjust tracking.

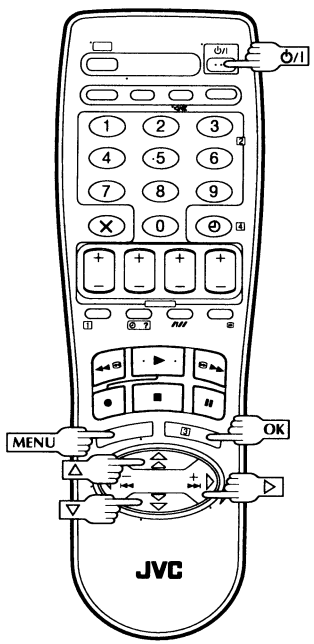
3 RETURN TO AUTOMATIC TRACKING

Press ▲/▼ on the remote to re-engage automatic tracking.

NOTE:

When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

Colour System Set



You can play back PAL, NTSC and MESECAM tapes, or record PAL and SECAM* signals on this recorder. Follow the procedure below to select the appropriate colour system.

* SECAM signals will be recorded as MESECAM on this recorder; MESECAM is the designation for tapes with SECAM signals that have been recorded on a MESECAM-compatible PAL video cassette recorder.

1 TURN ON THE RECORDER

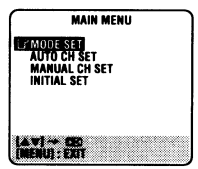
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

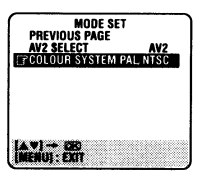
3 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



4 SELECT COLOUR SYSTEM MODE

Press △▽ to move the highlight bar (pointer) to "COLOUR SYSTEM", then press **OK** or ▷ to select the appropriate colour system.



a- PAL/NTSC: To record PAL signals, or play back a PAL or NTSC tape.

b- MESECAM: To record SECAM signals, or play back a MESECAM tape.

5 RETURN TO NORMAL SCREEN

Press **MENU**.

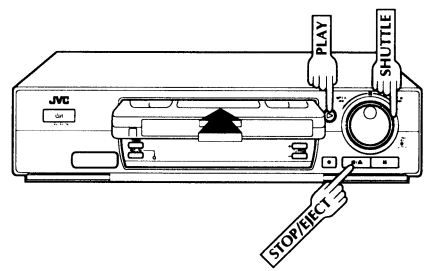
NOTES:

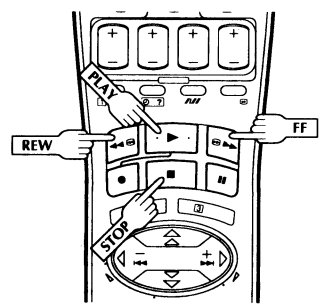
About NTSC Playback

- *Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.*
- *The picture may roll up and down. This can be corrected using the V-HOLD control found on some TVs. (This cannot be corrected if the TV does not have a V-HOLD control.)*
- *The counter and tape remaining time readings will be incorrect.*
- *During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.*
- *Depending on the type of TV, the top and bottom portions of superimposed displays may be cut off during NTSC playback.*

Basic Playback

Turn on the TV and select the VIDEO channel (or AV mode).

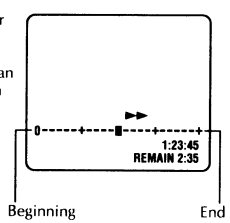




Tape Position Indicator

The tape position indicator appears on screen when, from the Stop mode, you press **FF**, **REW** or perform an Index Search. The position of "■" in relation to "0" (beginning) or "+" (end) shows you where you are on the tape.

"O.S.D." (☞ pg. 9) must be set to "ON", or the indicator will not appear.



NOTE:

Depending on the type of tape used, there may be times when the indication is not correct.

The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is pointed toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- If the record safety tab has been removed, playback begins automatically.

2 FIND PROGRAMME START POINT

If the tape is advanced past the start point, press **REW** or turn the **SHUTTLE** ring to the left.
To go forward, press **FF** or turn the **SHUTTLE** ring to the right.

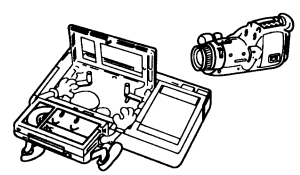
3 START PLAYBACK

Press **PLAY**. "BEST" appears blinking in the recorder's display panel during automatic tracking. (☞ pg. 22)

4 STOP PLAYBACK

Press **STOP** on the remote or **STOP/EJECT** on the recorder's front panel. Then press **STOP/EJECT** to remove the cassette.

Usable cassettes



- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.

Picture Control

This feature helps you to adjust the playback picture quality according to your preference. *The default setting is "AUTO."

1 ACCESS MAIN MENU SCREEN

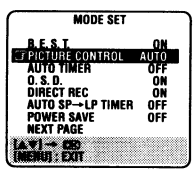
Press **MENU**.

2 ACCESS MODE SET SCREEN

Move the highlighted bar (pointer) to "MODE SET" by pressing △▽, then press **OK** or ▷.

3 SELECT PICTURE CONTROL SET MODE

Move the highlighted bar (pointer) to "PICTURE CONTROL" by pressing △▽, then press **OK** or ▷ to select the desired mode.



AUTO: Provides optimised picture benefits of B.E.S.T. Picture System. Normally select AUTO.

EDIT: Minimizes picture degradation during editing (recording and playback).

SOFT: Reduces image coarseness when viewing overplayed tapes containing a lot of noise.

SHARP: Clearer, sharper-edged picture when viewing images with lots of flat, same-coloured surfaces such as cartoons.

NOTES:

- *When you select EDIT, SHARP or SOFT, the selected mode will not change until you select again.*
- *When you select EDIT to dub tapes, be sure to select AUTO after you finish dubbing the tapes.*

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *When B.E.S.T. is OFF, "PICTURE CONTROL" switches automatically from AUTO to NORM.*
- *Select EDIT when you are dubbing tapes. Refer to page 32.*

Soundtrack Selection

Your video recorder is capable of recording three soundtracks (HI-FI L, HI-FI R and NORM) and will play back the one you select.

During Playback

Pressing **AUDIO** on the remote control changes the soundtrack being played back as follows:

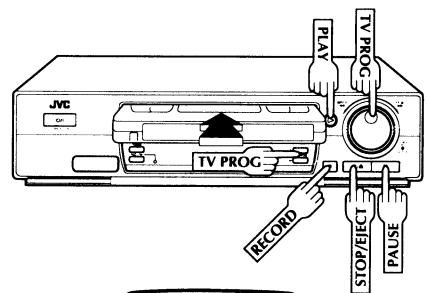
TRACK	USE
On-Screen Display	
HI FI L R	For Hi-Fi stereo tapes
HI FI L	For main audio of Bilingual tapes
HI FI R	For sub audio of Bilingual tapes
NORM	For audio-dubbed tapes
HI FI NORM	For audio-dubbed tapes

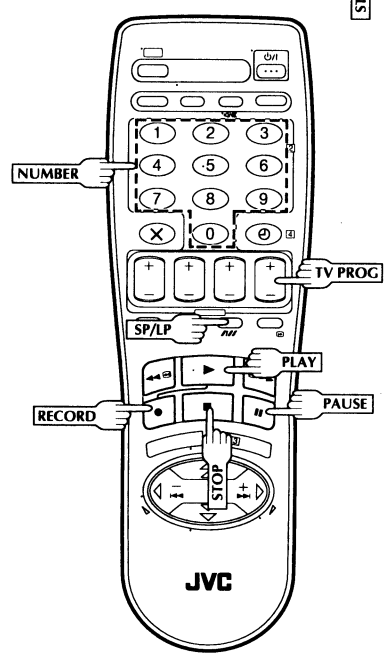
NOTES:

- *"HIFI L R" should normally be selected. In this mode, Hi-Fi stereo tapes are played back in stereo, and the normal audio track is played back automatically for tapes with only normal audio.*
- *For instructions on recording stereo and bilingual programmes, refer to page 21.*
- *"O.S.D." must be set to "ON" or the on-screen displays will not appear (☞ pg. 9).*

Basic Recording

Turn on the TV and select the VIDEO channel (or AV mode).





Recording Resume Function

If there is a power outage during recording (or Instant Timer Recording or timer recording), the recording will resume automatically when power is restored to the recorder unless the recorder's memory backup has expired.

TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

1 LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

- The counter is reset to 0:00:00 and the recorder power comes on automatically.

2 CHOOSE A PROGRAMME

Press **TV PROG +/–** or the **NUMBER** keys to select the channel you wish to record.

- The **TV PROG** dial can also be used to select a channel.

3 SET TAPE SPEED

Press **SP/LP** ( ). Check the SP/LP indicator on the recorder display panel to confirm the selected tape speed.

4 START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote control, or press **RECORD** on the recorder.

B.E.S.T. takes place at the beginning of both the first SP and the first LP recording after inserting the cassette (☞ pg. 22).

If "DIRECT REC" is set to "ON", the programme that appears on the TV screen will be recorded (☞ pg. 11).

5 PAUSE/RESUME RECORDING

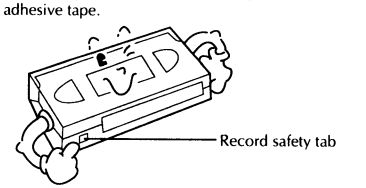
Press **PAUSE**. Press **PLAY** to resume recording.

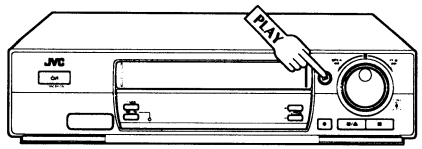
6 STOP RECORDING

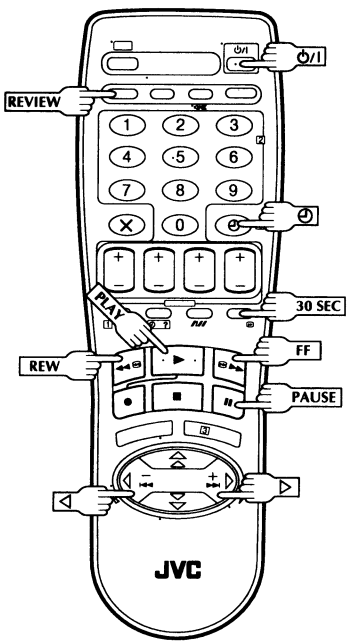
Press **STOP** on the recorder control or **STOP/EJECT** on the recorder. Then press **STOP/EJECT** to remove the cassette.

Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.







Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.

▶▶I 2

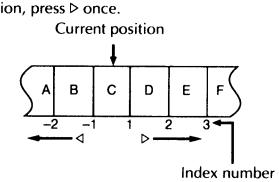
NOTE:

Before starting, make sure the recorder is in the Stop mode.

1 ACTIVATE INDEX SEARCH

Press ◁ or ▷ (I◀◀ or ▶▶I). "I◀◀ 1" or "▶▶I 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press ◁ or ▷ repeatedly until the correct index number is displayed.
  Ex.: To locate the beginning of B from the current position, press ◁ twice.
  To locate the beginning of D from the current position, press ▷ once.



- When the specified index code is located, playback begins automatically.

Skip Search

1 SKIP OVER UNWANTED SECTIONS

Press **30 SEC** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTE:

*To return to normal playback during a Skip Search, press **PLAY**.*

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the Timer mode is disengaged.

1 ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically.

- The front display panel tells you how many programmes have been timer-recorded. If you have, for example, 3 programmes, "REVIEW" and "3" appear and blink. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

NOTES:

- *Instant ReView is not possible while the recorder is in the Timer mode.*
- *The number of recorded programmes will not be displayed on the front display panel after Auto Satellite Prog recording (☞ pg. 30).*

Next Function Memory

The Next Function Memory "tells" the recorder what to do after rewinding. Before continuing, make sure the recorder is in the Stop mode.

a– For Automatic Start Of Playback After Tape Rewind . . .
. . . press **REW**, then press **PLAY** within 2 seconds.
b– For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press ⏻/I within 2 seconds.
c– For Automatic Timer Standby After Tape Rewind . . .
. . . press **REW**, then press ◴ (**TIMER**) within 2 seconds.

Repeat Playback

Your video recorder can automatically play back the whole tape 50 times repeatedly.

1 START PLAYBACK

Press **PLAY**.

2 ACTIVATE REPEAT PLAYBACK

Press **PLAY** and hold for over 5 seconds, then release.

- The Play indicator (▷) on the display panel blinks slowly.
- The tape plays 50 times automatically, and then stops.

3 STOP PLAYBACK

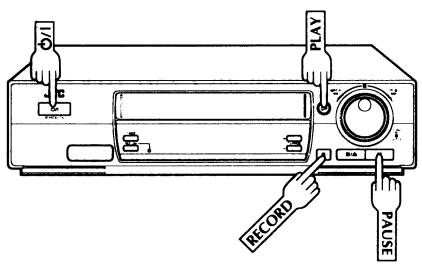
Press **STOP** at any time to stop playback.

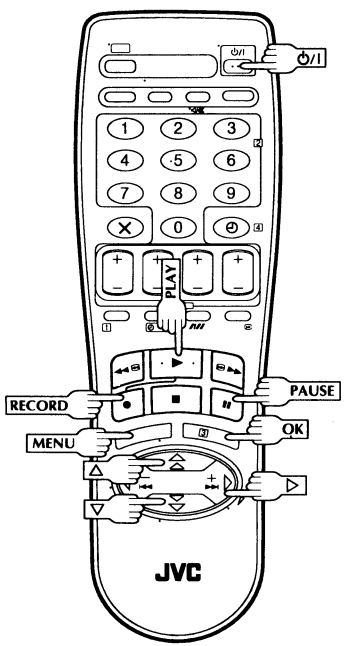
NOTE:

*Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.*

B.E.S.T. Picture System

Turn on the TV and select the VIDEO channel (or AV mode).





The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

Preparation

1 TURN ON THE RECORDER

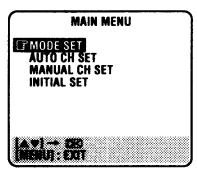
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

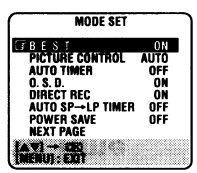
3 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.



4 SELECT B.E.S.T. MODE

Press △▽ to move the highlight bar (pointer) to "B.E.S.T.", then press **OK** or ▷ to set to "ON" or "OFF".



5 RETURN TO NORMAL SCREEN

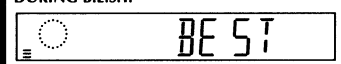
Press **MENU**.

Recording

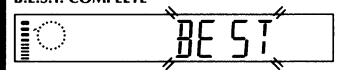
1 START RECORDING

Press and hold **RECORD** and press **PLAY** on the remote, or press **RECORD** on the recorder.

DURING B.E.S.T.



B.E.S.T. COMPLETE



- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.

NOTES:

- *The B.E.S.T. system works for both SP and LP modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.*
- *The B.E.S.T. system does not work while Auto Satellite Prog recording is in progress (☞ pg. 30).*
- *In the case of timer recording, the B.E.S.T. system works before recording is initiated.*
- *Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.*
- *Pressing the recorder's **RECORD** button while "BEST" is displayed does not start Instant Timer Recording (☞ pg. 20).*

ATTENTION

*Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after **RECORD** and **PLAY** on the remote are pressed, or **RECORD** on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:*

*1) Press and hold **PAUSE** and press **RECORD** to engage the RECORD PAUSE mode.*
- *The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.*

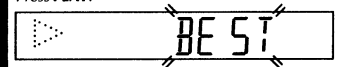
*2) Press **PLAY** to start recording.*
- *If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step **4** on page 22.*

Playback

The recorder assesses the quality of the tape once you initiate playback.

1 START PLAYBACK

Press **PLAY**.

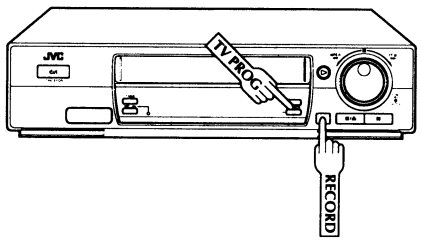


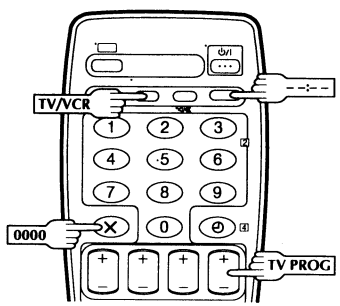
- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

- *When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.*
- *When watching a rental tape or one recorded on another video recorder, or when using this recorder as the player for editing, set B.E.S.T. to your preference by performing steps **1** through **5** on page 22.*
- *"BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.*

Recording Features





Instant Timer Recording (ITR)

This easy method lets you record for from 30 minutes to 6 hours (selectable in 30-min. increments), and shuts the recorder off after recording is finished.

1 START RECORDING

Press **RECORD** on the recorder.

2 ENGAGE ITR MODE

Press **RECORD** again. "◌" blinks and 0:30 appears on the front display panel.

3 SET RECORDING DURATION

If you want to record for more than 30 minutes, press **RECORD** to extend the time. Each press extends recording time by 30 minutes.

NOTE:

*You can only perform ITR using the **RECORD** button on the recorder's front panel.*

Record One Programme While Watching Another

*If your recorder is connected to the TV via AV connection, ... press **TV/VCR**. The recorder's VCR indicator and the TV broadcast being recorded disappear.*

1 SELECT CHANNEL TO WATCH

Once recording is in progress, all you need to do is to set the channel controls on the TV for the station you wish to view.

- The programme selected with the TV's channel controls appears on the TV screen while the one selected with the recorder's **TV PROG** buttons is recorded on the tape.
- If a decoder is connected to the recorder (☞ pg. 36), you can select a scrambled channel as well with the TV channel controls.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1 SET COUNTER DISPLAY

Press – –:– – until a counter reading appears on the display panel.

2 RESET COUNTER

Press **0000** before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Tape Remaining Time

1 DISPLAY REMAINING TIME

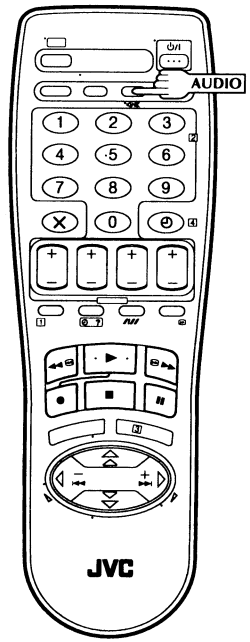
Press – –:– – until the time remaining on the tape appears.

- The display panel shows the tape remaining time with "◺" displayed.
- By pressing the – –:– – button, you can change the display to show the counter reading, channel position*, clock time or tape remaining time.

** channel position is not displayed during playback.*

NOTE:

Depending on the type of tape used, there may be times when the tape remaining time reading may not appear right away, or is not correct. "– –:– –" may sometimes appear, or the display may blink on occasion.



Receiving Stereo And Bilingual Programmes

Your recorder is equipped with a Sound-Multiplex decoder (A2) and a Digital stereo sound decoder (NICAM) making reception of stereo and bilingual broadcasts possible.

When the channel is changed, the type of broadcast being received will be displayed on the TV screen for a few seconds.

Type of Broadcast Being Received	On-screen Display
A2 Stereo	ST
A2 Bilingual	BIL
Regular Monaural	(none)
NICAM Stereo	ST NICAM
NICAM Bilingual	BIL NICAM
NICAM Monaural	NICAM

- To listen to a stereo programme, press **AUDIO** until "HIFI L 🔈 🔉 R" appears on the screen.
- To listen to a bilingual programme, press **AUDIO** until "HIFI L 🔈" or "HIFI 🔉 R" appears on the screen (as required).
- To listen to the Standard (regular monaural) audio while receiving a NICAM broadcast, press **AUDIO** until "NORM" appears on the screen.

NOTE:

"O.S.D." must be set to "ON" or the on-screen displays will not appear (☞ pg. 9).

To Record Stereo And Bilingual Programmes (A2)

- Stereo programmes are automatically recorded in stereo on the Hi-Fi audio track (with the normal audio track recording mixed L and R channel sound).
- Bilingual programmes are automatically recorded in bilingual on the Hi-Fi audio track. The main soundtrack will be recorded on the normal audio track.

To Record NICAM Stereo And Bilingual Programmes

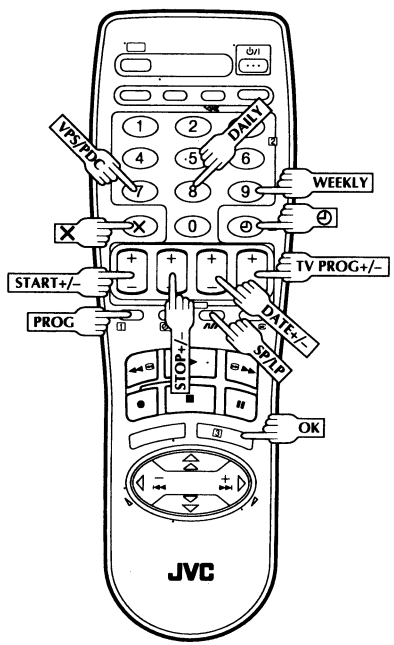
The NICAM audio programme will be recorded on the Hi-Fi audio track, and the Standard audio programme on the normal audio track.

NOTES:

- *If the quality of stereo sound being received is poor, the broadcast will be received in monaural with better quality.*
- *Before playing back a programme recorded in stereo, or a bilingual programme, refer to "Soundtrack Selection" (☞ pg. 18).*

Express Timer Programming

Before performing Express Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



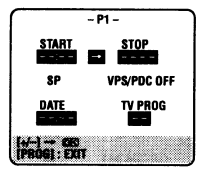
If you don't know the SHOWVIEW number for the programme you wish to record, use the following procedure to set your recorder to timer-record the programme.

1 ACCESS SHOWVIEW SCREEN

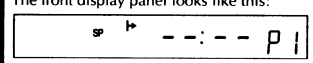
Press **PROG**.

2 ACCESS PROGRAMME SCREEN

Press **START +/–**. (If you're just starting out, "P1" appears.)



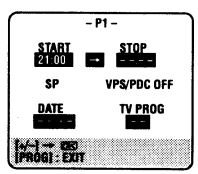
The front display panel looks like this:



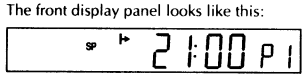
3 ENTER PROGRAMME START TIME

Press **START +/–** to enter the time you want recording to start.

- Press and hold **START +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



The front display panel looks like this:



4 ENTER PROGRAMME STOP TIME

Press **STOP +/–** to enter the time you want recording to stop.

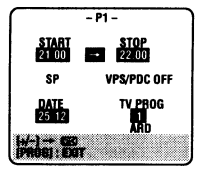
- Press and hold **STOP +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

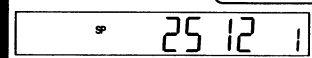
5 ENTER PROGRAMME DATE

Press **DATE +/–**. (The current date appears on screen. The date you enter appears in its place.)

6 ENTER CHANNEL POSITION

Press **TV PROG +/–**.





7 SET TAPE SPEED

Press **SP/LP** (▮▮▮) to set the tape speed.

8 SET VPS/PDC MODE

Press **VPS/PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, VPS/PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, VPS/PDC is set to OFF.
☞ "VPS/PDC Recording" in the right column.

9 RETURN TO NORMAL SCREEN

After confirming all information is correct, press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **9** for each additional programme.

10 ENGAGE RECORDER'S TIMER MODE

Press ⏲ (**TIMER**). The recorder turns off automatically and ⏲ appears on the display panel.

- To disengage the timer, press ⏲ (**TIMER**) again.

To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps **2** *through* **9**, *press* **WEEKLY** (**NUMBER** *key "9") for weekly serials or* **DAILY** (**NUMBER** *key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.*

NOTE:

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 28).

Satellite Tuner Users
To timer-record a satellite broadcast using Express Timer Programming:
1. Set "AV2 SELECT" to "AV2" (☞ pg. 33).
2. Perform steps **1** – **10**. Enter "L-2" for the channel position in step **6**.
3. Set the satellite tuner to the appropriate channel before the selected programme begins.
4. Leave the satellite tuner's power on.

VPS/PDC Recording

Now available from some TV stations, PDC (Programme Delivery Control) and VPS (Video Programme System) are service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over the advertised times you may have preset into the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed.

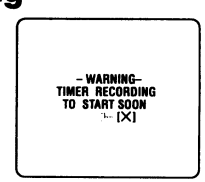
NOTES:

- *When you use Express Timer Programming, set the start time (VPS or PDC time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.*
- *VPS/PDC recording is also possible when a satellite tuner or a cable system is connected to AV2 IN/DECODER on your recorder.*
- *VPS/PDC recording is also possible via the AV1 IN/OUT connector.*

How to check if the station being received transmits a VPS/PDC signal
1. Press – –:– – until the channel position appears on the display panel.
2. Hold down **START+** for about 5 seconds.
   - "VPS/PDC" appears blinking on the display panel.
   If a VPS/PDC signal is detected from the station, "VPS/PDC" will stop blinking.
   If no VPS/PDC signal is detected from the station, "VPS/PDC" will blink at a slower rate.
3. Press – –:– – or **START+** again to return to normal display.

Timer Warning

If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on screen to tell you that the recording is to start in 5 minutes.



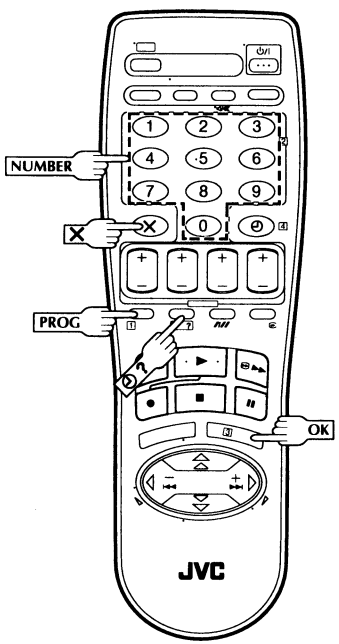
NOTES:

- *The warning only appears if you're not in the Timer mode at that time.*
- *If this recorder is being used as the player for tape dubbing, the warning screen is recorded on the tape in the other video recorder.*

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press ✕.

SHOWVIEW Timer Programming

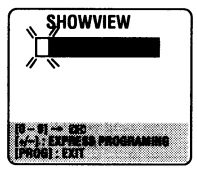
Before performing SHOWVIEW Timer Programming:
- Make sure that the recorder's built-in clock is set properly.
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



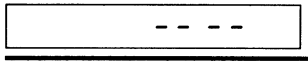
With SHOWVIEW, timer programming is greatly simplified because each TV programme has a corresponding code number which your recorder is able to recognize.

1 ACCESS SHOWVIEW SCREEN

Press **PROG**.

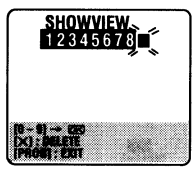


The front display panel looks like this:



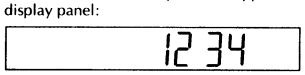
2 ENTER SHOWVIEW NUMBER

Press the **NUMBER** keys to enter the SHOWVIEW number of a programme you wish to record.



- If you make a mistake, press X and input the correct number.

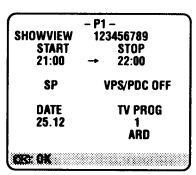
The SHOWVIEW number you enter appears on the front display panel:



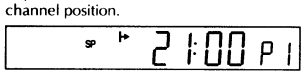
The display panel can show only a 4-digit number.

3 ACCESS SHOWVIEW PROGRAM SCREEN

Press **OK**, and the SHOWVIEW Program screen appears (if you're just starting out, "P1" appears).

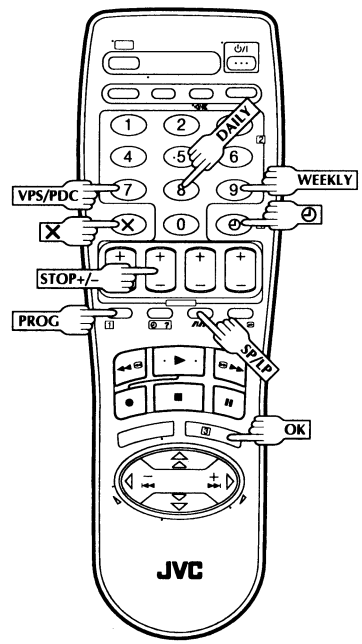


The display panel shows the programme start time. Pressing ◴ **?** changes the display to the programme stop time, then the date and channel position.



IMPORTANT
Make sure the channel position number you wish to record is displayed; if not, see "SHOWVIEW Setup" on page 48 and set the Guide Program number for that SHOWVIEW number correctly.

- If the number you entered is invalid, "ERROR" appears on the screen and "Err" appears on the display panel. Press X and input a valid SHOWVIEW number.
- If the "GUIDE PROG SET" screen appears, see "ATTENTION – Regarding Guide Program Number Set" on page 25.



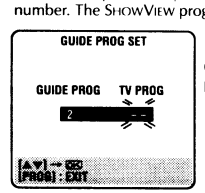
Satellite Tuner Users
To timer-record a satellite broadcast using SHOWVIEW:
1. Set "AV2 SELECT" to "AV2" (☞ pg. 33).
2. Perform steps **1** – **7**.
3. Set the satellite tuner to the appropriate channel before the selected programme begins.
4. Leave the satellite tuner's power on.

ATTENTION

Regarding Guide Program Number Set

"GUIDE PROG SET" appears after performing step **3** if the Guide Program number for the SHOWVIEW number you entered has not been set.

- Press the **NUMBER** keys or △▽ to input the channel position number on which your recorder receives that station, then press **OK** or ▷ to set the Guide Program number. The SHOWVIEW program screen appears.



(Ex.) To timer-record a ZDF programme with SHOWVIEW.
* If your recorder receives ZDF on the channel position 2, press **OK** or ▷ after entering "2".

4 SET TAPE SPEED

Press **SP/LP (▮▮▮)** to set the tape speed.

5 SET VPS/PDC MODE

Press **VPS/PDC** to select "ON" or "OFF".
If "VPS/PDC ON" is displayed on the screen or "VPS/PDC" is lit on the display panel, VPS/PDC is set to ON.
If "VPS/PDC OFF" is displayed on the screen or "VPS/PDC" is not lit on the display panel, VPS/PDC is set to OFF.
☞ "VPS/PDC Recording" on page 27.

6 RETURN TO NORMAL SCREEN

Press **PROG** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps **1** – **6** for each additional programme.

7 ENGAGE RECORDER'S TIMER MODE

Press ◴ **(TIMER)**. The recorder turns off automatically and ◴ appears on the display panel.

- To disengage the timer, press ◴ **(TIMER)** again.

NOTES:

- *To Change The Stop Time . . .*
  *. . . press **STOP +/–** after pressing **OK** in step **3**. You can compensate for anticipated programme schedule delays this way.*
- *To Timer-Record Weekly Or Daily Serials . . .*
  *. . . after pressing **OK** in step **3**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.*
- *You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 28).*
- *It is not possible to timer-record a TV programme with a SHOWVIEW number which starts with "0".*

Timer Warning

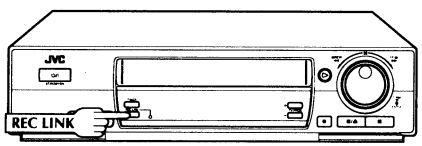
If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on screen to tell you that the recording is to start in 5 minutes.

NOTES:

- *The warning only appears if you're not in the Timer mode at that time.*
- *If this recorder is being used as the player for tape dubbing, the warning screen is recorded on the tape in the other video recorder.*

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press X.

Automatic Satellite Programme Recording



This facility allows you record automatically a satellite programme which is timer-programmed on your external satellite tuner. Connect a satellite tuner to the recorder's AV2 IN/DECODER connector (☞ pg. 34) and programme the timer on the satellite tuner; the recorder starts recording when the signals input from the satellite tuner to the AV2 IN/DECODER connector, and when there is no input signals the recorder stops recording and the power shuts off.

Before performing the following steps:
- Make sure the satellite tuner is connected to the recorder's AV2 IN/DECODER connector. (☞ pg. 34)
- Programme the timer on the satellite tuner.
- Insert a cassette with the safety tab in place.

1 SELECT AV2 SELECT MODE

Set "AV2 SELECT" to "AV2" (☞ pg. 33).

2 SET TAPE SPEED

Press **SP/LP** (**///**) to set the tape speed.

3 ENGAGE AUTO SATELLITE PROG REC MODE

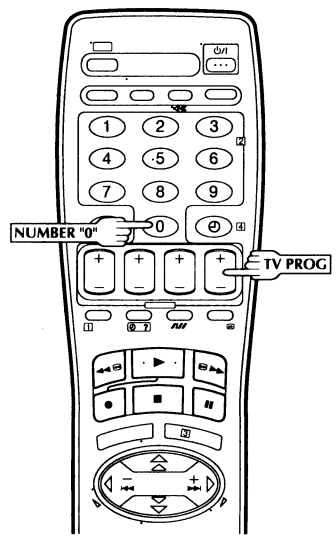
Press and hold **REC LINK** on the recorder for about 2 seconds. The REC LINK indicator lights up and the recorder turns off automatically.

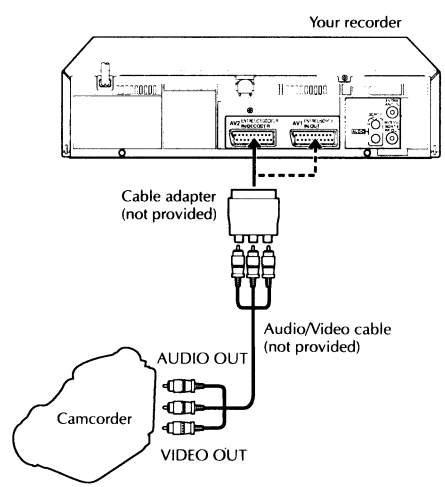
- To disengage the Auto Satellite Prog Rec mode, press **REC LINK**. The REC LINK indicator goes off.
- If the recorder's power is off, it is not possible to engage the Auto Satellite Prog Rec mode.

ATTENTION
- Be sure not to turn on the satellite tuner before the programme is executed; otherwise, the recorder will start recording when the satellite tuner's power is turned on.
- If you have connected another appliance other than a satellite tuner to the AV2 IN/DECODER connector, be sure not to engage the Auto Satellite Prog Rec mode; otherwise, the recorder will start recording when the connected appliance's power is turned on.
- Auto Satellite Prog recording and timer-recording cannot be done at the same time.

NOTES:
- *Auto Satellite Prog recording is possible with the AV2 IN/DECODER connector only. (☞ pg. 35)*
- *For timer programming of the satellite tuner, refer to the instruction manual of the satellite tuner.*
- *Auto Satellite Prog recording is not possible if your satellite tuner does not have a timer.*
- *The REC LINK indicator blinks while Auto Satellite Prog recording is in progress.*
- *Pressing the recorder's ⏻/I button while Auto Satellite Prog recording is in progress turns off the recorder's power and disengage the Auto Satellite Prog Rec mode.*
- *If there are more than one satellite programme you wish to record with Auto Satellite Prog Recording, it is not possible to set the different tape speed per each; the tape speed selected in step **2** will be applicable to all the programmes for Auto Satellite Prog recording.*
- *The B.E.S.T. system (☞ pg. 22) does not work while Auto Satellite Prog recording is in progress.*
- *Just Clock (☞ pg. 46) does not work when the Auto Satellite Prog Rec mode is engaged.*
- *Depending on the type of satellite tuner, the recorder may not record a slight portion of the beginning of the programme or may record slightly longer than the actual length of the programme.*
- *If you engage the Auto Satellite Prog Recording mode when the satellite tuner's power is on, the recorder will not start Auto Satellite Prog recording even though the REC LINK indicator blinks. When the satellite tuner shuts off once and is turned back on again, the recorder starts recording.*
- *When the Auto Satellite Prog Rec mode is engaged or the recorder's power is turned off after Auto Satellite Prog recording is finished, the recorder will not enter the Timer mode even though "AUTO TIMER" is set to "ON".*
- *After Auto Satellite Programme recording, the number of recorded programmes will not be displayed on the front display panel for the Instant ReView function (☞ pg. 17).*
- *You can also record a programme from your cable system in the same way if the system has a timer.*
- *When you press and hold the recorder's **REC LINK** button to engage the Auto Satellite Prog Rec mode, if the REC LINK indicator does not light but instead blinks quickly even though your satellite receiver's power is off, Auto Satellite Prog Recording will not work properly with that satellite receiver*.*
  If this is the case, perform "Express Timer Programming" (☞ pg. 26) to timer-record a satellite programme.
  ** Some satellite receivers output signals even if the power is off. Auto Satellite Prog Recording is not possible with those satellite receivers.*

Edit From A Camcorder





You can use a camcorder as the source player and your video recorder as the recorder.

1 MAKE CONNECTIONS

Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's AV2 IN/DECODER or AV1 IN/OUT connector via the cable adapter.

2 SET RECORDER'S INPUT MODE

Press **NUMBER** key "0" and/or **TV PROG** to select depending on the connector being used — "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN/DECODER connector.

- When using the AV2 IN/DECODER connector, make sure "AV2 SELECT" is set to "AV2" (☞ pg. 33).

3 SET EDIT MODE

See "Picture Control" on page 18.

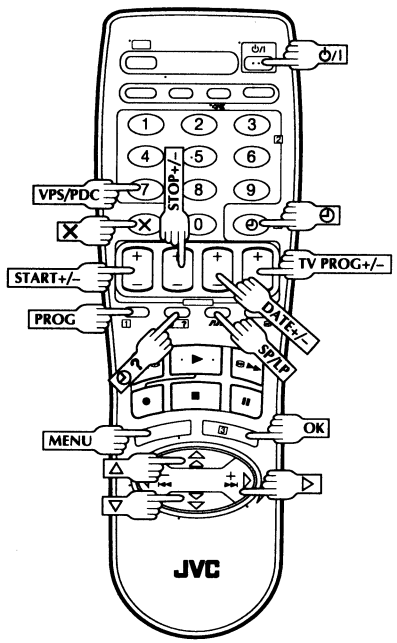
4 START CAMCORDER

Engage its Play mode.

5 START RECORDER

Engage its Record mode.

NOTES:
- *All necessary cables can be obtained from your dealer.*
- *When you select EDIT to dub tapes in step **3**, be sure to select AUTO (or NORM when B.E.S.T. is set to OFF) after you finish dubbing the tapes.*



Check, Cancel And Replace Programmes

1 DISENGAGE TIMER MODE

Press ⏲ (**TIMER**), then press ⏻/I.

2 ACCESS PROGRAM CHECK SCREEN/DISPLAY

Press ⏲ **?**.

PR	START	STOP	CH	DATE
1	8:00	10:00	3	24.12
2	10:00	10:45	2	25.12
3	11:30	13:00	1	25.12
4				
5				
6				
7				
8				

⏲ **?**: NEXT

P1P8

3 ACCESS PROGRAM SCREEN/DISPLAY

Press ⏲ **?** again to check more information. Each time you press ⏲ **?**, the next programme's information appears.

– P1 –
START 8:00 → STOP 10:00
SP
VPS/PDC OFF
DATE 24.12
TV PROG 3 WDR
⏲ **?**: NEXT

SP ▶ 8:00 P1

- The display panel shows the programme start time. Pressing **OK** changes the display to the programme stop time, then the date and the channel position.

To cancel or replace a programme...

4 CANCEL OR REPLACE A PROGRAMME

Press ✕ to cancel a programme. To replace a programme, press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **TV PROG+/–**, **VPS/PDC**, **SP/LP** (▮▮▮).

5 RETURN TO NORMAL SCREEN/DISPLAY

Press ⏲ **?** as many times as necessary. If there are still some programmes remaining, go on to step **6**.

6 RETURN TO TIMER MODE

Press ⏲ (**TIMER**).

NOTE:

You can also check the programmes on the display panel even if the recorder's power is off (unless the recorder is in the Power Save mode ☞ pg. 10) or the recorder is in the Timer mode; however, it is not possible to cancel or replace the programmes.

Auto SP→LP Timer

If, when timer-recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode to allow complete recording.

For Example . . .

Recording a programme of 210 minutes in length onto a 180-minute tape

Approximately 150 minutes	Approximately 60 minutes
SP mode	LP mode

Total 210 minutes

Make sure you set "AUTO SP→LP TIMER" to "ON" at the Mode Set screen before the timer-recording starts.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.

3 SELECT MODE

Press △▽ to move the highlight bar (pointer) to "AUTO SP→LP TIMER", then press **OK** or ▷ to select "ON".

MODE SET
B. E. S. T. ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
O. S. D. ON
DIRECT REC ON
AUTO SP→LP TIMER ON
POWER SAVE OFF
NEXT PAGE
▲▼/→ SEL
MENU : EXIT

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *If you have programmed the recorder to timer-record 2 or more programmes, the second programme and those thereafter may not fit on the tape if you set "AUTO SP→LP TIMER" to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.*
- *In order to ensure that the recording fits on the tape, this feature may leave a slight non-recorded section at the end of the tape.*
- *There may be some noise and sound disturbance at the point on the tape where the recorder switches from SP to LP mode.*
- *The Auto SP→LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 or with some tapes of shorter lengths.*
- *If you perform timer recording with both VPS/PDC and the Auto SP→LP Timer activated, and the programme goes beyond its originally scheduled length, there may be times when the programme cannot be recorded in its entirety.*

Auto Timer

When the Auto Timer is set to ON the timer is automatically engaged when the recorder power is turned off and automatically disengaged when the recorder is powered back on.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS MODE SET SCREEN

Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.

MAIN MENU
MODE SET
AUTO CH SET
MANUAL CH SET
INITIAL SET
▲▼/→ SEL
MENU : EXIT

3 SELECT MODE

Press △▽ to move the highlight bar (pointer) to "AUTO TIMER", then press **OK** or ▷ to select either "ON" or "OFF".

MODE SET
B. E. S. T. ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
O. S. D. ON
DIRECT REC ON
AUTO SP→LP TIMER OFF
POWER SAVE OFF
NEXT PAGE
▲▼/→ SEL
MENU : EXIT

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTE:

*For safety, when Auto timer is set to "OFF", all other recorder functions are disabled while the Timer mode is engaged. To disengage the timer, press ⏲ (**TIMER**).*

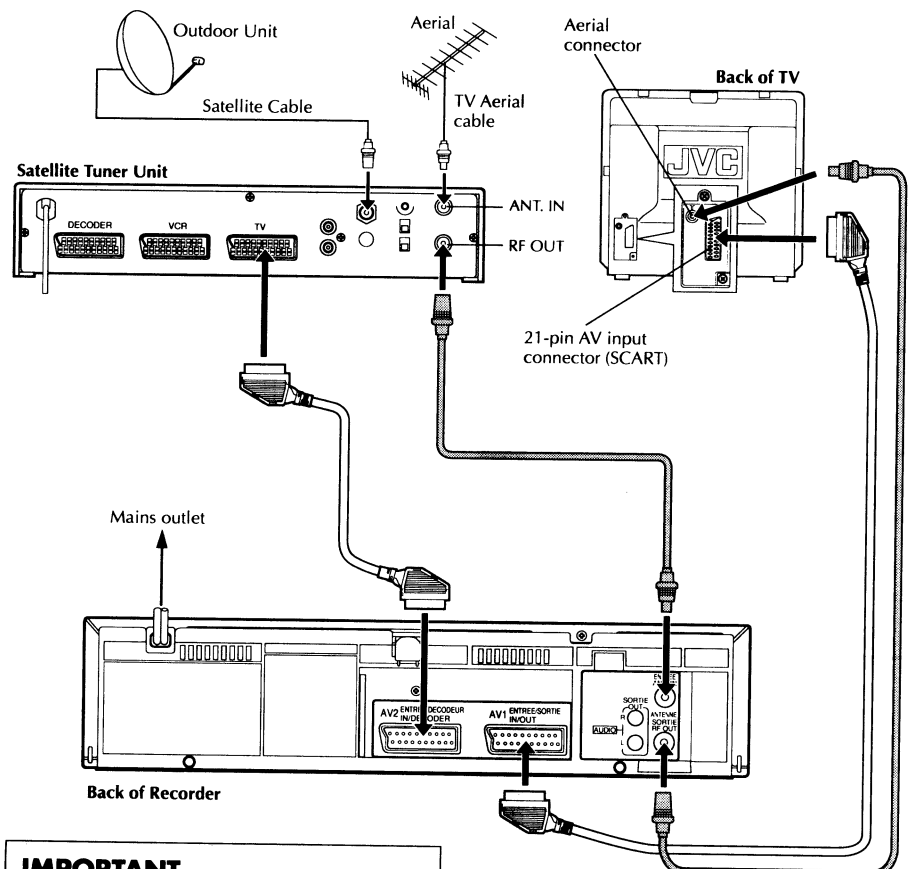
Connection To A Satellite Tuner

If you don't have a decoder . . .

Connect the satellite tuner to the video recorder's AV2 IN/DECODER connector, then connect the recorder's AV1 IN/OUT connector to the TV's 21-pin SCART connector.

NOTES:

- *Set "AV2 SELECT" to "AV2". (☞ pg. 33)*
- *You can use Automatic Satellite Program Recording function (☞ pg. 30) with this connection.*
- *To view a programme via the satellite tuner, select L-2 mode by pressing **NUMBER** keys and/or **TV PROG** so that "L-2" appears on the display panel.*
- *For details, refer to the instruction manual for the satellite tuner.*



IMPORTANT

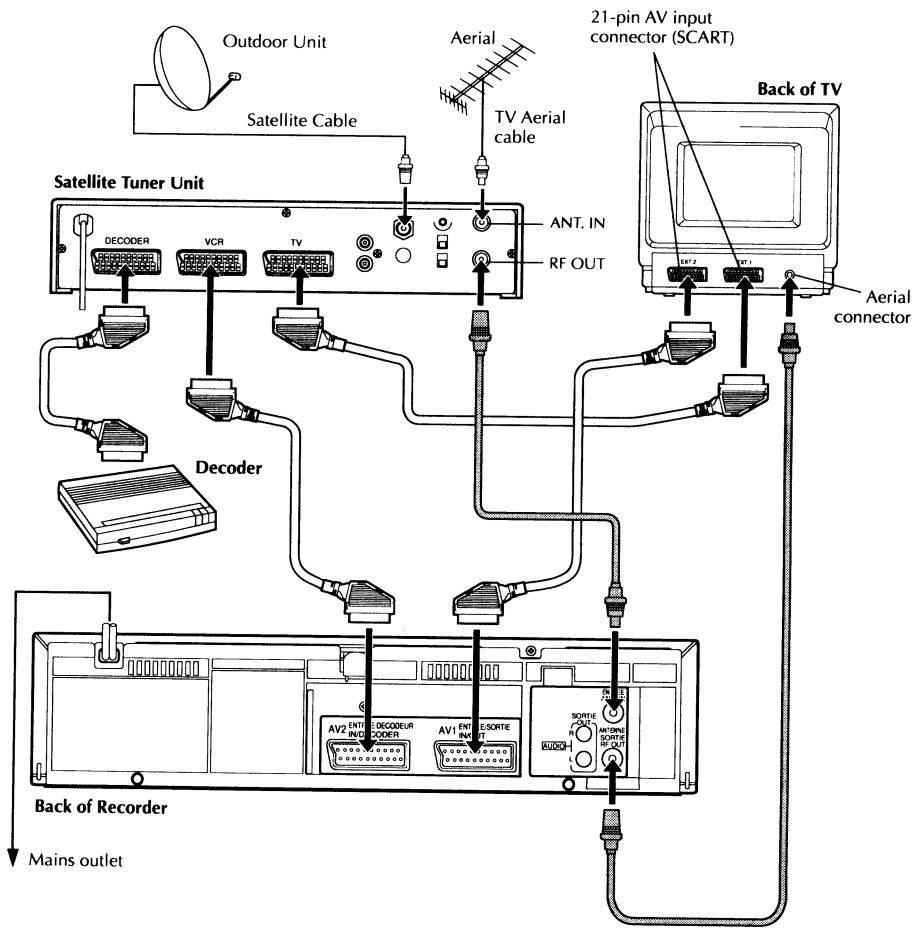
When you set "AV2 SELECT" to "SAT" (☞ pg. 33), it is possible to view a satellite broadcast with the TV set to its AV mode even if the recorder is in Timer mode, in Stop mode, recording or turned off. When the recorder is in Stop mode or recording, press **TV/VCR** on the remote control to turn off the VCR indicator on the display panel.

If you have a decoder . . .

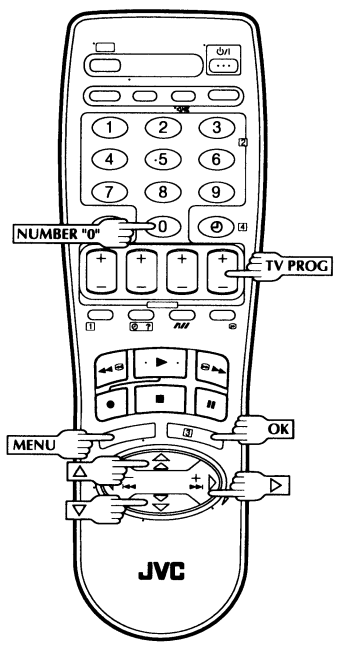
Connect the decoder to the satellite tuner's connector, AV1 IN/OUT connector to TV's connector, and AV2 IN/DECORDER connector to the satellite tuner's connector. Then connect the satellite tuner and TV.

NOTES:

- *Set "AV2 SELECT" to "AV2". (☞ pg. 33)*
- *To view a programme via the satellite tuner, select L-2 mode by pressing **NUMBER** keys and/or **TV PROG** so that "L-2" appears on the display panel.*
- *To receive a scrambled broadcast, descramble the signal with the satellite tuner.*
- *For details, refer to the instruction manual for the satellite tuner and decoder.*



Edit To Or From Another Video Recorder



You can use your video recorder as the source player or the recording deck.

1 MAKE CONNECTIONS

Connect the player's 21-pin SCART (AV) connector to the recorder's 21-pin SCART (AV) connector as illustrated on page 33.

When Using Your Video Recorder As The Source Player . . .
. . . connect its AV1 IN/OUT connector to the recording deck.

When Using Your Video Recorder As The Recording Deck . . .
. . . connect its AV2 IN/DECODER or AV1 IN/OUT connector to the source player.

2 SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press **NUMBER** key "0" and/or **TV PROG** to select depending on the connector being used — "L-1" for the AV1 IN/OUT connector, or "L-2" for the AV2 IN/DECODER connector.

- When using the AV2 IN/DECODER connector, make sure "AV2 SELECT" is set to "AV2" (☞ pg. 33).

3 SET EDIT MODE

See "Picture Control" on page 18.

4 START SOURCE PLAYER

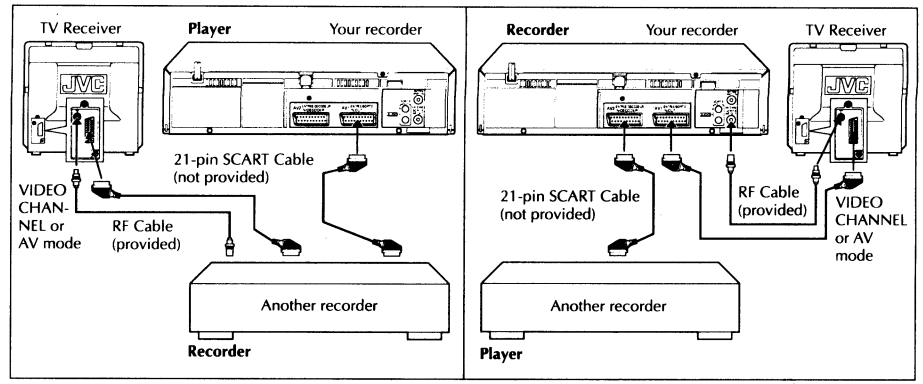
Engage its Play mode.

5 START RECORDING DECK

Engage its Record mode.

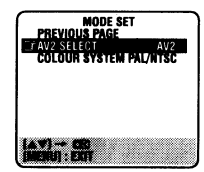
NOTES:

- *All necessary cables can be obtained from your dealer.*
- *When you select EDIT to dub tapes in step 3, be sure to select AUTO (or NORM when B.E.S.T. is set to OFF) after you finish dubbing the tapes.*
- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting (☞ pg. 9).*



AV2 SELECT Setting

1 Press **MENU** to access the Main Menu screen.
2 Press △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK** or ▷.
3 Press △▽ to move the highlight bar (pointer) to "AV2 SELECT".
4 Press **OK** or ▷ to select "AV2", "DECODER" or "SAT".
- **a**–AV2 : To use this recorder as the recording deck with the player connected to the AV2 IN/DECODER connector, or to use the satellite tuner connected to the AV2 IN/DECODER connector.
- **b**–DECODER : To use a decoder connected to the AV2 IN/DECODER connector.
- **c**–SAT : To view a satellite programme with the TV set while the recorder is in Timer mode, in Stop mode, recording or turned off. (☞ pg. 34)

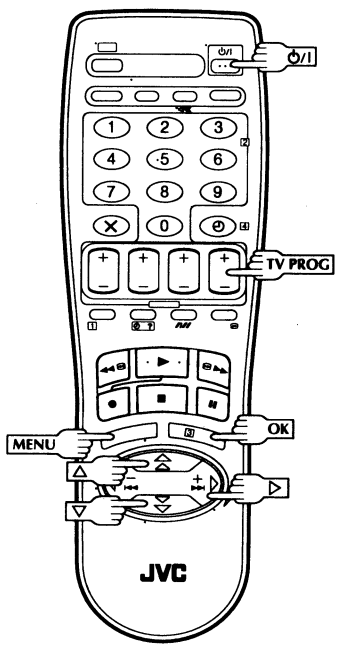


5 Press **MENU** to return to normal screen.

- If you have a decoder connected to the AV2 IN/DECODER connector, be sure to set "AV2 SELECT" back to "DECODER" after editing.
- If you're not connecting a decoder to the AV2 IN/DECODER connector, leave "AV2 SELECT" set to "AV2".
- The default setting is "AV2"; if the recorder's memory backup has expired due to a power cut or because the AC was removed from the recorder, "AV2" will be automatically selected when the power is restored to the recorder. If you are using a decoder, be sure to set "AV2 SELECT" back to "DECODER".

Tuner Set

Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT

Perform the following steps only if —
— Auto Channel Set has not been set correctly by Auto Set Up function or by Preset Download (☞ pg. 4, 6).
— you have moved to a different area or if a new station starts broadcasting in your area.

Your recorder needs to memorize all necessary stations in channel positions in order to record TV programmes. Auto Channel Set automatically assigns all receivable stations in your area to call them up by using the **TV PROG** buttons without going through any vacant channel.

Auto Channel Set

1 TURN ON THE RECORDER

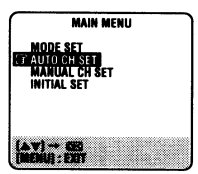
Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS AUTO CH SET SCREEN

Press △▽ to move the highlight bar (pointer) to "AUTO CH SET", then press **OK** or ▷.

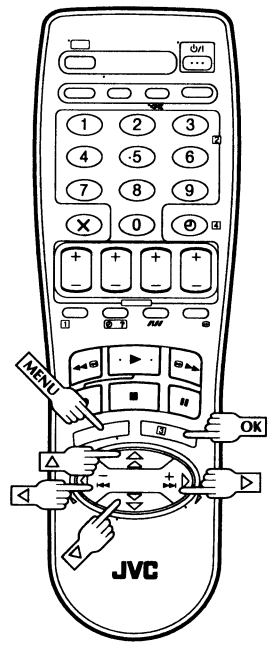


4 SELECT COUNTRY

Press △▽ to move the highlight bar (pointer) to your country's name, then press **OK** or ▷.

5 SELECT LANGUAGE

Press △▽ to move the highlight bar (pointer) to the language of your choice.



IMPORTANT

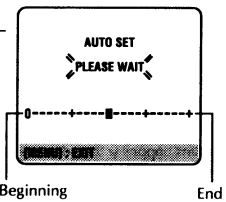
- In certain reception conditions, station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, when you timer-record a TV programme using SHOWVIEW, the recorder will record a TV programme of a different station. When programming the timer using SHOWVIEW, be sure to check whether the channel position on which your recorder receives the broadcasting station you wish to record is selected (☞ pg. 24, "SHOWVIEW Timer Programming").
- Your video recorder memorizes all detected stations even if reception of some of them is poor. In these cases picture quality may be poor. To delete those stations with an unacceptable picture ☞ "Delete A Channel" on page 41.

NOTES:

- *Fine tuning is performed automatically during Auto Channel Set. If you want to perform it manually, refer to page 44.*
- *If you perform Auto Channel Set when the aerial cable is not connected properly, "SCAN COMPLETED -NO SIGNAL-" appears on the screen in step 7. When this happens, make sure of the aerial connection and press **OK**; Auto Channel Set will take place again.*

6 PERFORM AUTO CHANNEL SET

Press **OK** twice.

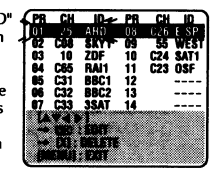


- You can set up the recorder's tuner also by Preset Download (☞ pg. 6).
- The Auto Set screen appears, and remains on screen while the recorder searches for receivable stations.

As Auto Channel Set progresses, the " ■ " mark on the screen moves from left to right.
Wait until the screen as shown in step 7 appears.

7 VIEW CONFIRMATION SCREEN

After "SCAN COMPLETED" is displayed on the screen for about 5 seconds, the Confirmation screen looking like the one to the right appears. The stations your recorder located appear on a Confirmation screen — channel positions (PR), channels (CH) and station names (ID – ☞ pg. 43). The blueback screen and the programme currently being broadcast by the blinking station appear alternately for 8 seconds each.
To view the next page, use the △▽◁▷ button on the remote control.


PR CH ID PR CH ID
01 25 ARD 06 C26 ESP
02 C28 SKYF 09 55 WEST
03 10 ZDF 10 C24 SAT1
04 C65 RAI1 11 C23 OSF
05 C31 BBC1 12 ----
06 C32 BBC2 13 ----
07 C33 3SAT 14 ----
MENU : EXIT
CH : DELETE
MENU : EXIT

C: Cable

- The stations located in the selected country appear at the top of the list.
- The Guide Program numbers will also be set automatically during Auto Channel Set.

8 RETURN TO NORMAL SCREEN

Press **MENU**.

- Using the Confirmation screen, you can skip or add channel positions, enter station names and perform other operations. Refer to pages 40 – 44 for the procedures.
- Depending on reception conditions, the stations may not be stored in order, and the station names may not be stored correctly.
- For information on scrambled broadcasts, refer to page 41.

SHOWVIEW Setup

IMPORTANT

Normally, Auto Set Up (☞ pg. 4), Preset Download (☞ pg. 6) or Auto Channel Set (☞ pg. 38) sets the Guide Program Numbers automatically. You need to set the Guide Program Numbers manually only in the following cases.

- *When timer-programming with SHOWVIEW, the channel position, where the station you wish to record is received on your recorder, is not selected or when you add a channel after Auto Set Up or Auto Channel Set has taken place.*
  — Set the Guide Program Number for that station manually.
- *When you delete a channel or change channel positions manually after Auto Set Up or Auto Channel Set has taken place.*
  — Set the Guide Program Numbers for all the receivable stations manually.
- *When you wish to timer-record a satellite programme with SHOWVIEW.*
  — Set the Guide Program Numbers for all satellite broadcasts received on your satellite tuner.

Turn on the TV and select the VIDEO channel (or AV mode).

Guide Program Number Set

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS INITIAL SET SCREEN

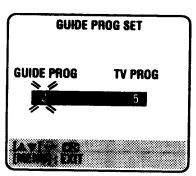
Press △▽ to move the highlight bar (pointer) to "INITIAL SET", then press **OK** or ▷.

3 ACCESS GUIDE PROG SET SCREEN

Press △▽ to move the highlight bar (pointer) to "GUIDE PROG SET", then press **OK** or ▷.

4 ENTER GUIDE PROG NUMBER

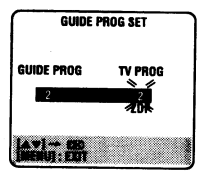
Press △▽ or **NUMBER** keys to enter the Guide Program number for the desired station as shown in the TV listings. Then press **OK** or ▷.



(Ex.) When inputting the Guide Program number 2 for ZDF.

5 ENTER RECEIVING CHANNEL POSITION NUMBER

Press △▽ or **NUMBER** keys to input the number of the recorder's channel position on which the Guide Program number's broadcast is received. Then press **OK** or ▷.



(Ex.) If ZDF is received on channel position 2.

- If the satellite broadcast is received on your recorder's auxiliary channel "L-2", select "L-2" for the channel position.
- Repeat steps **4** and **5** as necessary.

6 RETURN TO NORMAL SCREEN

Press **MENU**.

Guide Program Number

"Guide Program (GUIDE PROG) number" refers to the assigned TV station numbers, according to broadcast area, for SHOWVIEW timer recording. The Guide Program numbers can be found in most TV listings.

Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "⏲" is displayed on the display panel with Auto Timer set to "OFF".	Press the ⏲ button to turn the "⏲" indicator off.
3. The remote control won't function.	• The batteries are discharged.	Replace the dead batteries with new ones.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "▒" is displayed on the display panel.	Press **PLAY** to turn the "▒" indicator off.
2. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.

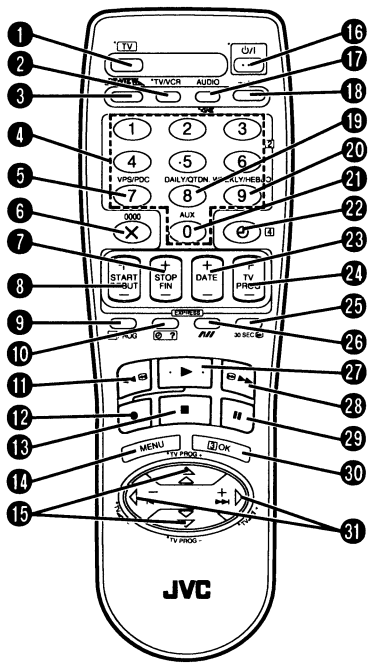
PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection . . . . . . the TV receiver's channel selector is not set to the VIDEO channel. . . . the recorder's VIDEO channel has not been correctly set. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection . . . . . . set the TV receiver to the VIDEO channel. (☞ pg. 5) . . . perform "Video Channel Set". (☞ pg. 45) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking. (☞ pg. 15)
4. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.
5. Breaks are noticeable in Hi-Fi soundtrack.	• Automatic tracking is engaged.	Engage and adjust tracking manually. (☞ pg. 15)

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette, or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "L-1" or "L-2" has been selected as the input mode.	Set to the desired channel.
3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on. • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "L-1" or "L-2".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "L-1" or "L-2".

REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your JVC TV while holding down the **TV** button. ☞ "Operating JVC TVs" below.

This remote control transmits A code signals only; it is not applicable to B code signals.

1. TV Button ☞ "Operating JVC TVs" below
2. TV/VCR Button ☞ pg. 20 and "Operating JVC TVs" below
3. REVIEW Button ☞ pg. 17
4. NUMBER Keys ☞ pg. 19, 24
5. VPS/PDC Button ☞ pg. 25, 27
6. ✕ Button ☞ pg. 28
   0000 Button ☞ pg. 20
7. STOP +/– Button ☞ pg. 26
8. START +/– Button ☞ pg. 26
9. PROG Button ☞ pg. 24
10. ◴ ? Button ☞ pg. 28
11. Rewind [REW] Button ☞ pg. 13, 14
12. Record Button ☞ pg. 19
13. Stop Button ☞ pg. 13, 19
14. MENU Button ☞ pg. 8
15. △▽ Button ☞ pg. 4
    TV PROG +/– ☞ "Operating JVC TVs" below
16. STANDBY/ON ⏻/I Button ☞ pg. 4
17. AUDIO Button ☞ pg. 18
    🔇 (TV Muting) Button ☞ "Operating JVC TVs" below
18. DISPLAY Button ☞ pg. 20
19. DAILY Button ☞ pg. 25, 27
20. WEEKLY Button ☞ pg. 25, 27
21. AUX Button ☞ pg. 32
22. ◴ Button ☞ pg. 25, 27
23. DATE +/– Button ☞ pg. 26
24. TV PROG +/– Button ☞ pg. 19
25. 30 SEC Button ☞ pg. 16
26. Auto Tracking Button ☞ pg. 15
    SP/LP Button ☞ pg. 19
27. Play Button ☞ pg. 13
28. Fast Forward [FF] Button ☞ pg. 13, 14
29. Pause Button ☞ pg. 14
30. OK Button ☞ pg. 5
31. ◁▷ Button ☞ pg. 14, 15, 16
    TV ◿ +/–Button ☞ "Operating JVC TVs" below

How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of JVC TV sets. (See the right column.)

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

Operating JVC TVs

To operate your TV, while holding down the **TV** button, press the corresponding button: **STANDBY/ON** ⏻/I, **TV/VCR**, **TV PROG +/–**, **TV** ◿ **+/–**, 🔇 (TV Muting).

NOTES:

- *When inserting the batteries, be sure to insert in the correct directions as indicated under the battery cover.*
- *Depending on the type of JVC TV, there may be cases where some or all functions cannot be operated using the remote control.*
- *If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.*

EN

HR-J768EU

Auto Set Up – referring to the display panel

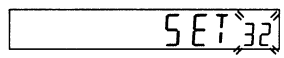
The Auto Set Up function sets the tuner channels, clock, Guide Program numbers and video channel* automatically.

* Useful for RF connection users.

BEFORE YOU START PLEASE MAKE SURE THAT:

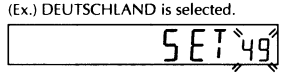
- The TV aerial cable is connected to the ANT.IN jack on the rear panel of the video recorder.
- The video recorder's mains power cord is connected to a mains outlet.
- The video recorder is turned off.
- Load batteries into the remote control.

1 Press ⏻/I (recorder/remote).



2 Press △▽ (remote) to select the international telephone country code.

(Ex.) DEUTSCHLAND is selected.



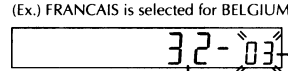
International Telephone Country Code

BELGIUM	: 32	NORGE	: 47
ČESKÁ REPUBLIKA	: 42	ÖSTERREICH	: 43
DANMARK	: 45	POLSKA	: 48
DEUTSCHLAND	: 49	PORTUGAL	: 351
ESPAÑA	: 34	SUISSE	: 41
GREECE	: 30	SUOMI	: 358
ITALIA	: 39	SVERIGE	: 46
MAGYARORSZÁG	: 36	OTHER WESTERN EUROPE	: - -
NEDERLAND	: 31	OTHER EASTERN EUROPE	: EE

- If you have selected a country code other than 32 (BELGIUM) or 41 (SUISSE), go to step **3**.
- If you have selected 36 (MAGYARORSZAG), 42 (CESKA REPUBLIKA), 48 (POLSKA) or EE (OTHER EASTERN EUROPE), press **OK**. Clock Set screen will appear. Set the clock manually (☞ pg. 46 – 47), then go to step **3**.

- If you have selected 32 (BELGIUM) or 41 (SUISSE), press **OK** (remote) and select the language code by pressing △▽ (remote), then go to step **3**.

(Ex.) FRANCAIS is selected for BELGIUM



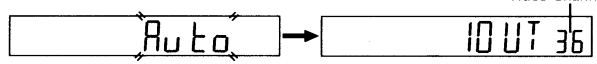
International Telephone Country Code — Language Code

Language Code

ENGLISH	: 01	NORSK	: 08
DEUTSCH	: 02	SUOMI	: 09
FRANCAIS	: 03	DANSK	: 10
ITALIANO	: 04	POLSKI	: 11
CASTELLANO	: 05	ČEŠTINA	: 12
NEDERLANDS	: 06	MAGYAR	: 13
SVENSKA	: 07		

3 Press **OK** twice (remote). Do NOT press any button on the video recorder or remote control until the display panel shows as follows.

Video Channel



- If "– –:– –" appears on the display panel, see page 7 of the instructions.
- If you have connected the video recorder to your TV via RF connection, press **OK** to finish the Auto Set Up. To view picture signals from the video recorder, set your TV to the Video Channel.
- If you have connected the video recorder to your TV via AV connection, press **TV PROG –** until the display panel shows "1OUT– –" to set the Video Channel to off, then press **OK** to finish the Auto Set Up. To view picture signals from the video recorder, set your TV to its AV mode.

* *Once you have performed Auto Set Up, even if the recorder's memory backup has expired, the recorder will not perform Auto Set Up again. Perform tuner setting (☞ pg. 38), clock setting (☞ pg. 46) and/or Video Channel setting (☞ pg. 45) as required.*

FOR MORE INFORMATION SEE INSTRUCTIONS/P4

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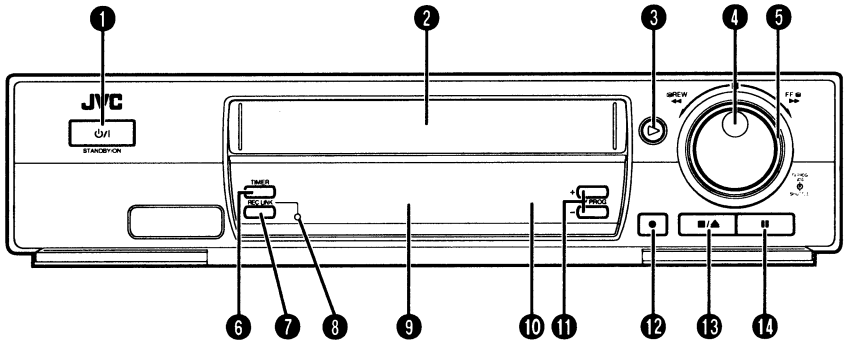
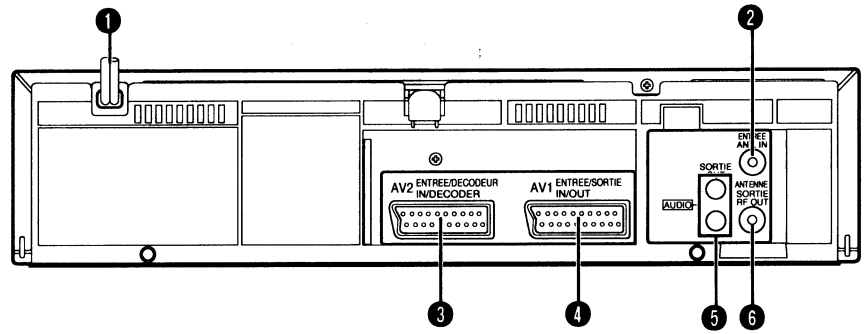
FRONT VIEW



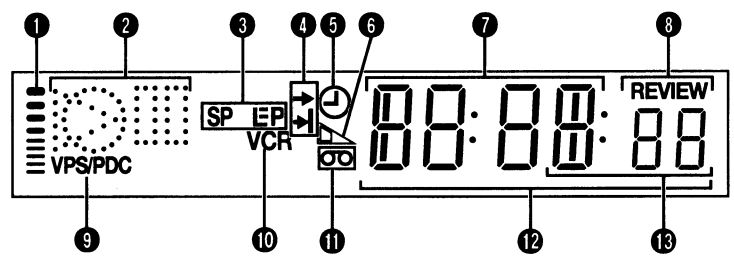
❶ STANDBY/ON ⏻/I Button ☞ pg. 4
❷ Cassette Loading Slot
❸ PLAY Button ☞ pg. 13
❹ TV PROG Dial ☞ pg. 19
JOG Dial ☞ pg. 14
❺ SHUTTLE Ring ☞ pg. 13, 14
❻ TIMER Button ☞ pg. 25, 27
❼ REC LINK Button ☞ pg. 30
❽ REC LINK Indicator ☞ pg. 30
❾ Display Panel ☞ pg. 53
❿ Infrared Beam Receiving Window
⓫ TV PROG +/– Buttons ☞ pg. 19
⓬ RECORD Button ☞ pg. 19
⓭ STOP/EJECT Button ☞ pg. 13
⓮ PAUSE Button ☞ pg. 14

REAR VIEW



❶ Mains Power Cord ☞ pg. 3
❷ ANT. IN Connector ☞ pg. 3
❸ AV2 IN/DECODER Connector
☞ pg. 31, 33, 34, 35, 36
❹ AV1 IN/OUT Connector
☞ pg. 3, 31, 33, 34, 35, 36
❺ AUDIO OUT (L/R) Connectors ☞ pg. 37
❻ RF. OUT Connector ☞ pg. 3

DISPLAY PANEL



❶ B.E.S.T. Picture System Display ☞ pg. 22
❷ Symbolic Mode Indicators

PLAY: FF/REW VARIABLE SHUTTLE SEARCH:	▷	STILL: SLOW:	▷Ⅲ
		RECORD:	○
		RECORD PAUSE:	○Ⅲ

❸ Tape Speed Indicators ☞ pg. 19
** EP is only for NTSC playback.*
❹ Programme Time Indicators ☞ pg. 26
❺ "Timer" Indicator ☞ pg. 25, 27
❻ Tape Remaining Time Indicator ☞ pg. 20
❼ Channel/Clock Display ☞ pg. 7
❽ Instant REVIEW Indicator ☞ pg. 17
❾ VPS/PDC Indicator ☞ pg. 25, 27
❿ VCR Indicator ☞ pg. 20
⓫ "Cassette Loaded" Mark
⓬ Counter/Remain Display
⓭ Mode Display (L-1 or L-2)

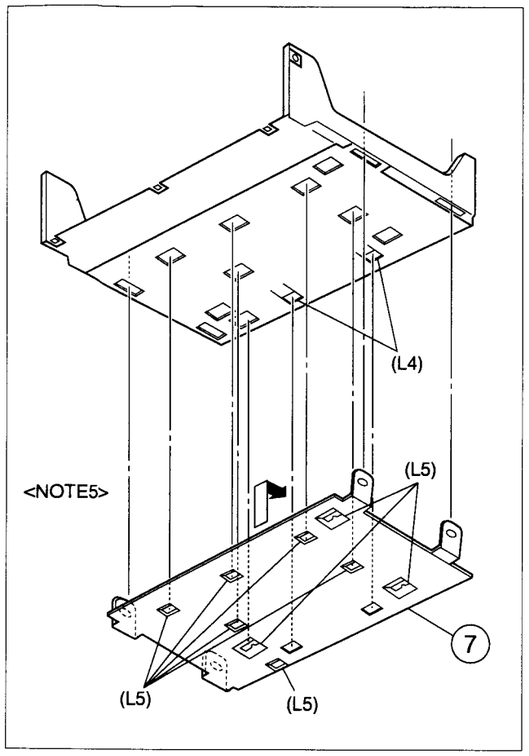


Fig. D7

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Mechanism assembly, this unit is constructed so as to allow the Mechanism and Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1.)
(2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Mechanism assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(3) Take out 2 screws Ⓐ and 2 screws Ⓑ as shown in Fig. 1-4-1.

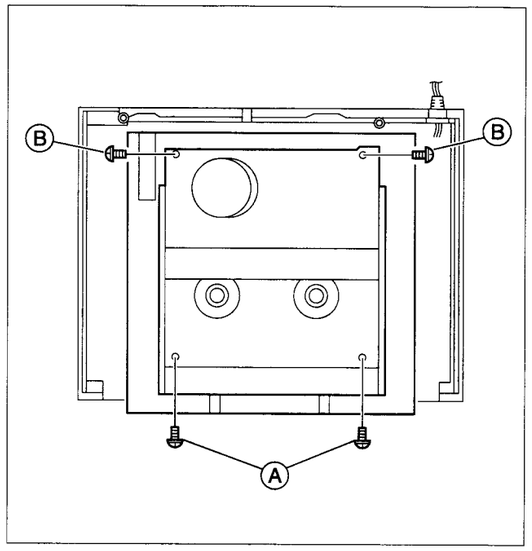


Fig. 1-4-1

(4) Take out 3 screws Ⓓ, 1 screw Ⓒ and 1 screw Ⓔ.
(5) Remove the Main board and Mechanism assemblies together while holding the edge of the Main board assembly. At this stage be careful of the power cord and prongs of the jacks on the back side. (See Fig. 1-4-2.)

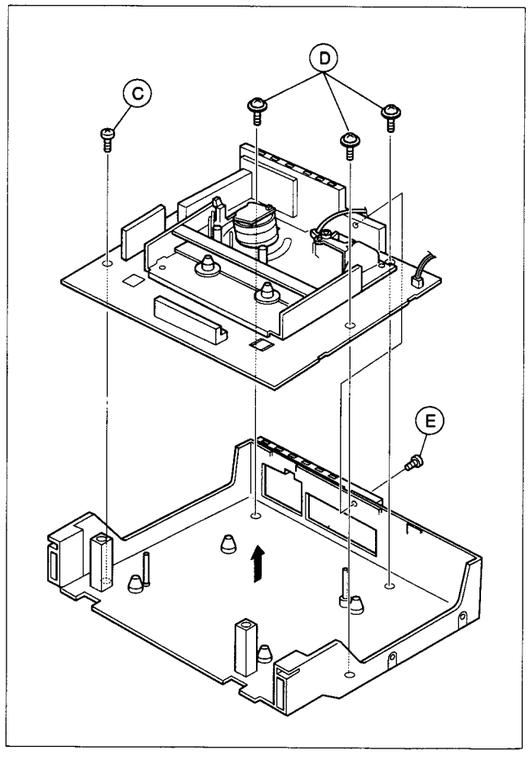
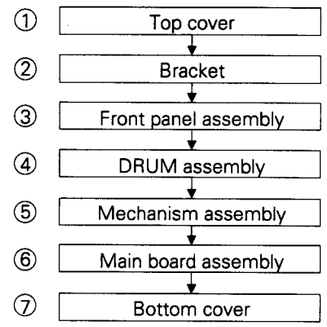


Fig. 1-4-2

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1), WR1 (HR-J768EU), *CN7004 (HR-J768EU)	<NOTE 1> <NOTE 2> <NOTE 3>
④	DRUM ASSEMBLY	D4	2(S4), DRUM SHIELD, 3(S5),WR2,WR3, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S6),2(S7),WR4, 2(L2), *CN1	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S8),(S9),(S10), 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 9(L5)	<NOTE 5>

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BRACKET	D2	2(S3)	
③	FRONT PANEL ASSEMBLY	D3	7(L1), WR1 (HR-J768EU), *CN7004 (HR-J768EU)	<NOTE 1> <NOTE 2> <NOTE 3>
④	DRUM ASSEMBLY	D4	2(S4), DRUM SHIELD, 3(S5),WR2,WR3, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S6),2(S7),WR4, 2(L2), *CN1	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	3(S8),(S9),(S10), 6(L3)	
⑦	BOTTOM COVER	D7	2(L4), 9(L5)	<NOTE 5>

<NOTE1>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE2>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob ⓑ of the Main board assembly from the side.
(If the switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3>
When inserting the flat wire into the connector, be careful not to mistake the positioning of its electrodes.

<NOTE4>
- When it is required to remove the screws (S6) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly"(See on pages 1-3).
- When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board. (D3001: LED, Q3002: Start sensor, Q3003: End sensor)

<NOTE5>
When remove the bottom cover, push down the two tabs L4 to slide the bottom cover.

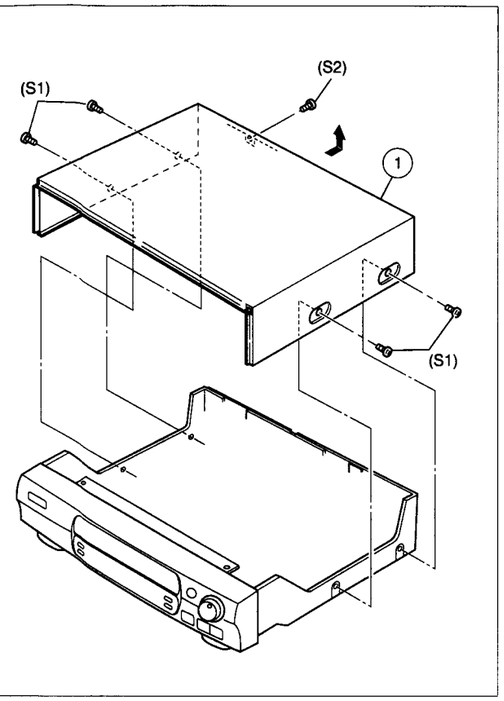


Fig. D1

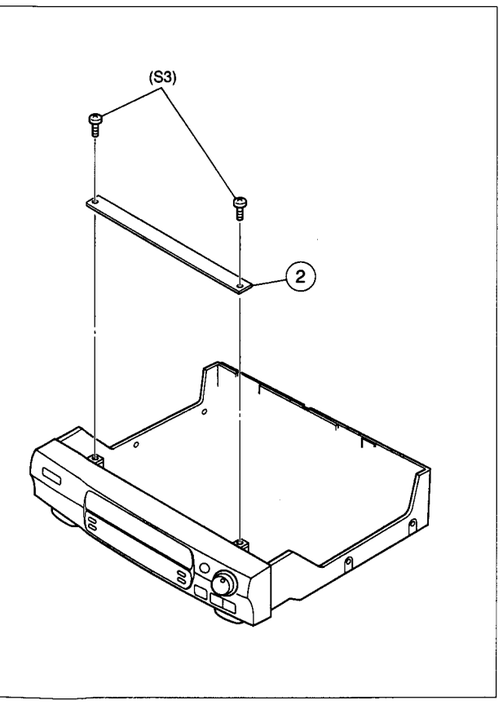


Fig. D2

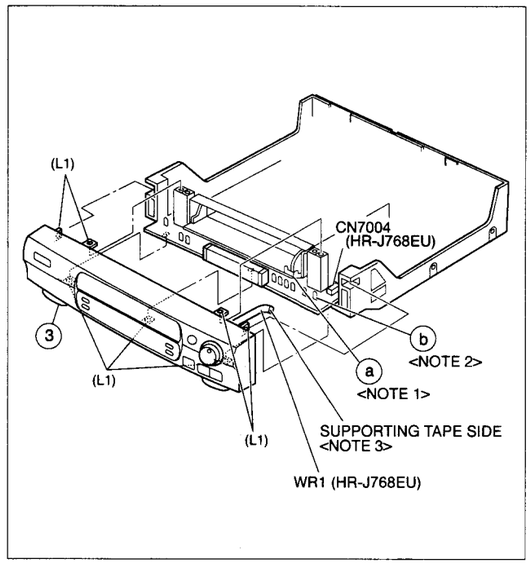


Fig. D3

NOTE : When installing the DRUM assembly, secure the screws (S5) in the order of A, B, C.

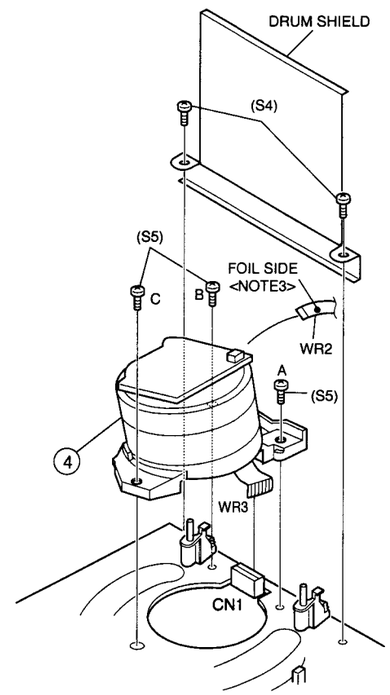


Fig. D4

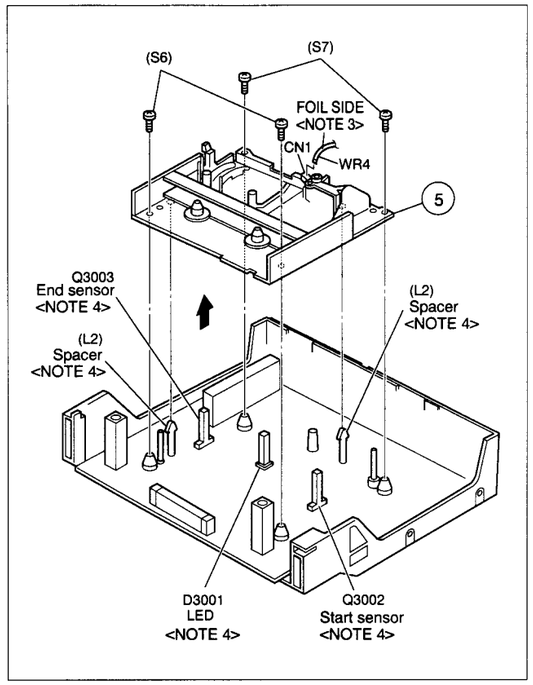


Fig. D5

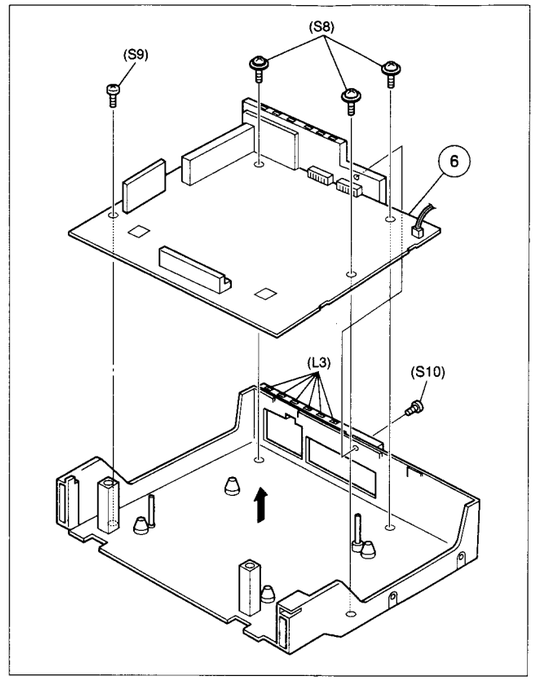


Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two screws unscrewed when removing the Mechanism assembly.

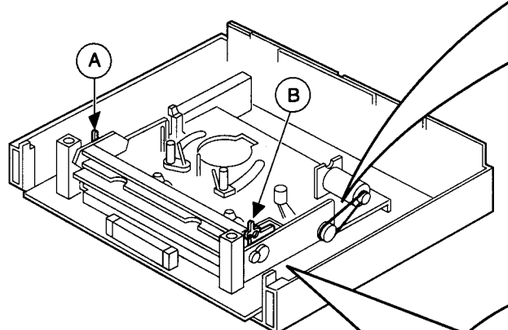


Fig. 1

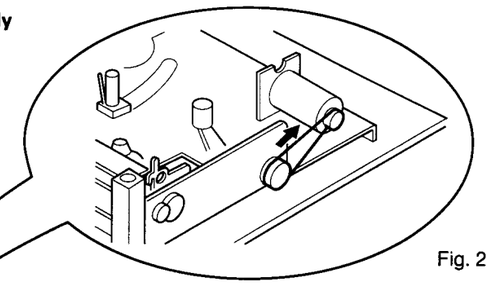


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both Ⓐ and Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

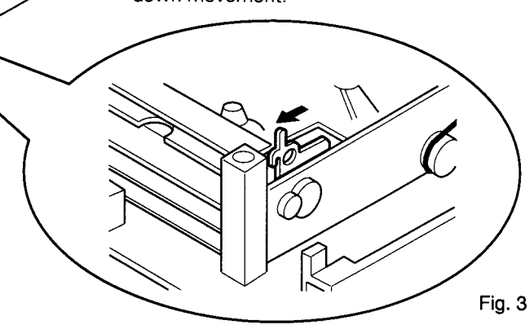


Fig. 3

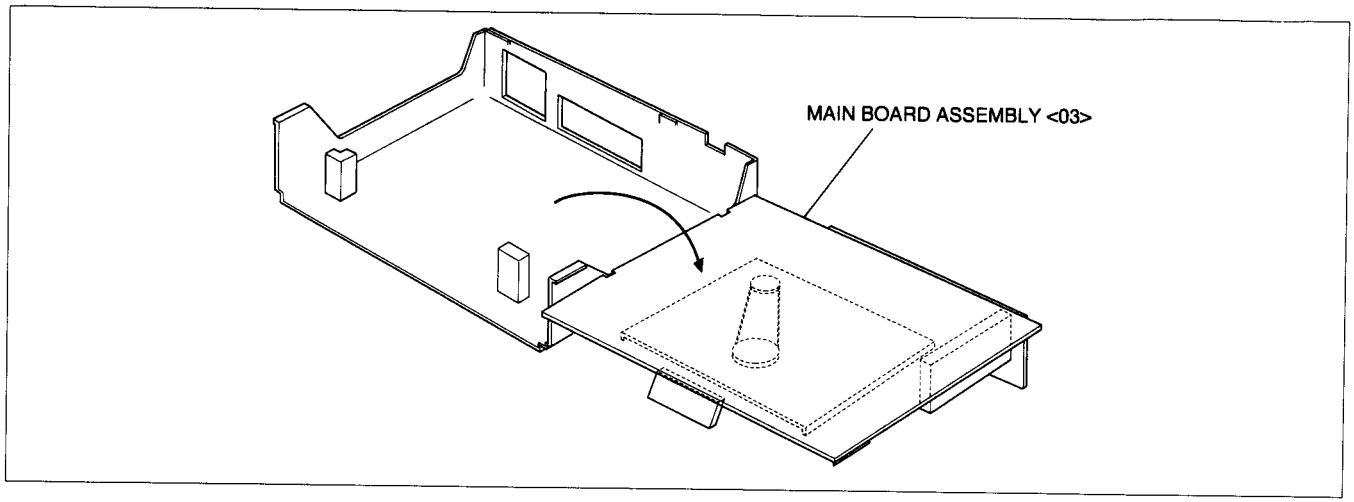


Fig. 1-4-3

(6) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

(7) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Mechanism assemblies together.

NOTES: • *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Mechanism assemblies.*

If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.

• *When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position.*

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Connect VCR to AC.
(4) Press the POWER button.
(5) With lock levers ⒶⒷ on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers ⒶⒷ, refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

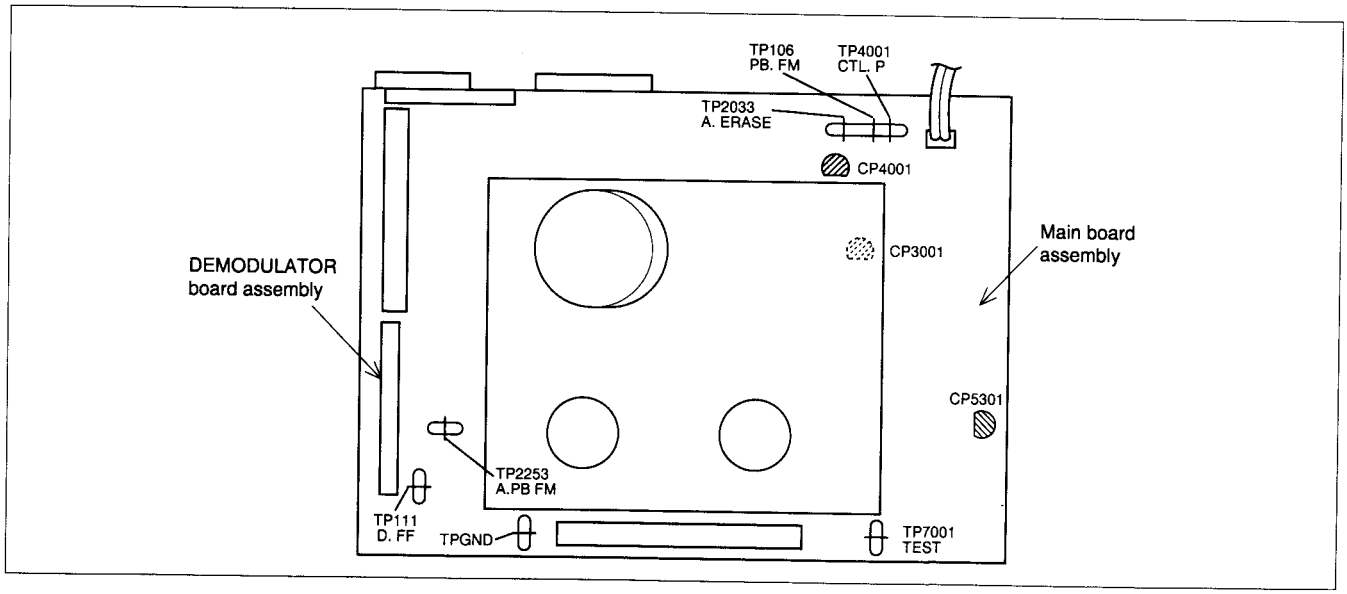


Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote controller. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press the "N" button of the presetting unit and the two previous emergency faults are shown in the FDP.
(2) Press the "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03

- 03 — Emergency fault before last
- 01 — Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	FUNCTION
1	CTL(+)	IN/OUT	CTL(+) SIGNAL
2	SVSS	-	GND
3	CTL(-)	IN/OUT	CTL(-) SIGNAL
4	CTLBIAS	-	CTL BIAS VOLTAGE
5	CTLFB	-	NC
6	CTLAMPOUT	OUT	CTL PULSE OUTPUT
7	CTLSMTIN	IN	CTL PULSE INPUT
8	CFG	IN	CAPSTAN FG PULSE INPUT
9	SVCC	-	SYSTEM POWER
10	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
11	MESECAM DET	OUT	MESECAM MODE: H
12	SECAM DET	-	NC
13	VIDEO ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
14	START SENSOR	IN	START SENSOR
15	END SENSOR	IN	END SENSOR
16	IND(L)	-	NC
17	IND(R)	-	NC
18	SCR ID	IN	SCRAMBLE CONTROL INPUT (SCRAMBLE:L)
19	NC	-	NC
20	AFC	IN	TUNING CLOCK
21	RF AGC	IN	CHANGES IN ATS+IC OUTPUT AS CAUSED BY CHANGES IN RECEIVER SENSITIVITY WHEN THE SAME CHANNEL IS RECEIVED MORE THAN ONCE ARE INPUT.
22	A.ENV/ND(L)	IN	AUDIO PB FM ENV.INPUT/NON HiFi MODE: L
23	AVSS	-	GND FOR ANALOG CIRCUIT
24	CTL GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
25	LSA	IN	MECHANISM MODE DETECT(A)
26	LSB	IN	MECHANISM MODE DETECT(B)
27	LSC	IN	MECHANISM MODE DETECT(C)
28	CAP REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
29	RC	IN	REMOTE CONTROL DATA INPUT
30	R.PAUSE	-	NC
31	PROJECT 50 IN	IN	CONTROL SIGNAL FOR T-V LINK
32	LMC3	OUT	LOADING MOTOR DRIVE(3)
33	PROJECT 50 OUT	OUT	CONTROL SIGNAL FOR T-V LINK
34	NC	-	NC
35	LMC1	OUT	LOADING MOTOR DRIVE(1)
36	LMC2	OUT	LOADING MOTOR DRIVE(2)
37	P.SAVE(L)	OUT	POWER SAVE: L
38	P.CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
39	SIDE BAND GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
40	POWER DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
41	REC SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
42	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY
43	VSS	-	GND
44	STB/TEST	OUT	STROBE SIGNAL (FOR FDP DRIVER)
45	VCC	-	SYSTEM POWER
46	JSA	IN	INPUT FOR THE JOG SHUTTLE
47	JSB	IN	INPUT FOR THE JOG SHUTTLE
48	STL(L)	IN	INPUT FOR THE JOG SHUTTLE
49	I2C DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR THE ON-SCREEN IC
50	I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK FOR THE ON-SCREEN IC
51	S.DATA TOSYS	IN	SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO THE FDP DRIVER
52	S.DATA FRSYS	OUT	SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC
53	S.CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC
54	SP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
55	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
56	LOCK(L)	IN	TUNING PLL LOCK DETECT:L
57	TU CE	OUT	CHIP ENABLE OF THE TUNER UNIT
58	SW2	OUT	TUNER SYSTEM "L" MODE:L
59	NC	-	NC
60	TU CLK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT

Table 1-7-1 SYSCON CPU pin function(1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	FUNCTION
61	TU DATA	OUT	TUNING DATA
62	FWE	-	NC
63	NMI(L)	-	NC
64	X2	-	TIMER CLOCK (32.768KHz)
65	X1	-	TIMER CLOCK (32.768KHz)
66	RES(L)	-	RESET TERMINAL (RESETON:L)
67	OSC1(IN)	-	MAIN SYSTEM CLOCK(10MHz)
68	VSS	-	GND
69	OSC2(OUT)	-	MAIN SYSTEM CLOCK(10MHz)
70	VCC	-	SYSTEM POWER
71	MODE	-	NC
72	TU A MUTE(H)	OUT	TUNER AUDIO MUTE CONTROL (MUTE:H)
73	TU V MUTE(H)	OUT	TUNER VIDEO MUTE CONTROL (MUTE:H)
74	SW1	OUT	TUNER "L" SYSTEM MODE:H
75	I2C CLK2	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
76	I2C DATA2	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
77	NC	-	NC
78	NC	-	NC
79	NC	-	NC
80	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE:H)
81	FMA_ADJ	-	NC
82	VCC	-	SYSTEM POWER
83	CCIR(H)	OUT	EXCEPT FOR NTSC (CCIR:H)
84	VSS	-	GND
85	SP SHORT(H)	OUT	MODE SELECT
86	LP SHORT(H)	OUT	MODE SELECT
87	N.REC ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START
88	H.REC ST(H)	OUT	HIFI AUDIO SOUND RECORDING START
89	B/W(H)	-	NC
90	NC	-	NC
91	OSD CS	OUT	CHIP SELECT FOR THE ON-SCREEN IC
92	SYNC DET(H)	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
93	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
94	SECAM(H)	-	NC
95	IP ON(H)	-	NC
96	NC	-	NC
97	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL (REC:H)
98	C.SYNC	IN	COMPOSITE SYNC
99	A.FF	OUT	AUDIO FF OUTPUT
100	V.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
101	CAPPWM	OUT	CAPSTAN MOTOR CONTROL
102	DRUMPWM	OUT	DRUM MOTOR CONTROL
103	NC	-	NC
104	S PB(H)/SP SEARCH(H)	-	NC
105	EE(L)	OUT	EE/PB CONTROL (EE MODE:L)
106	NC	-	NC
107	DPG	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
108	DFG	IN	DRUM FG PULSE INPUT
109	VCC	-	SYSTEM POWER
110	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
111	VSS	-	GND
112	CTLREF	-	CTL REFERENCE VOLTAGE

Table 1-7-2 SYSCON CPU pin function(2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of the cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE.)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(2) Unload the cassette by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1.)
(3) Bring the pole base assembly (supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top guide toward the drum while holding down the lug Ⓐ of the bracket retaining the top guide. Likewise hold part Ⓑ down and remove the top guide. Section Ⓒ of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-2.)
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

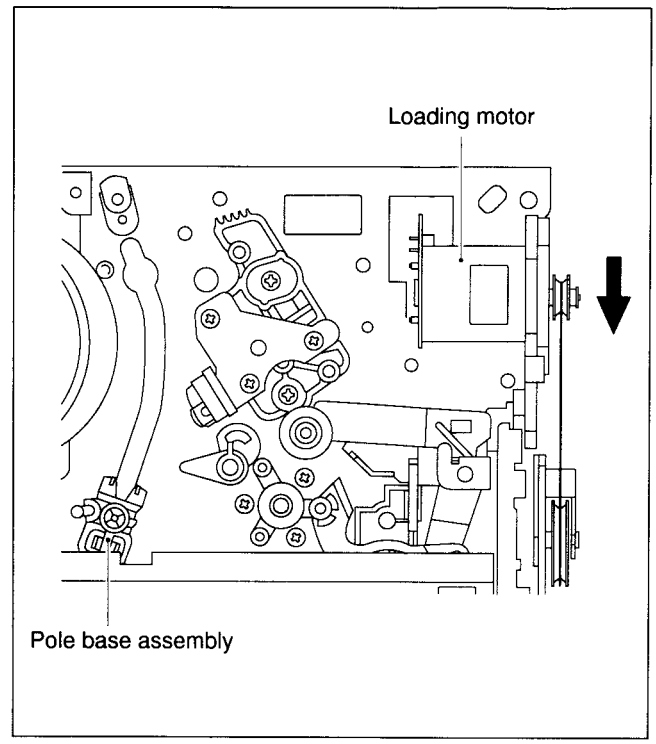


Fig. 2-1-1

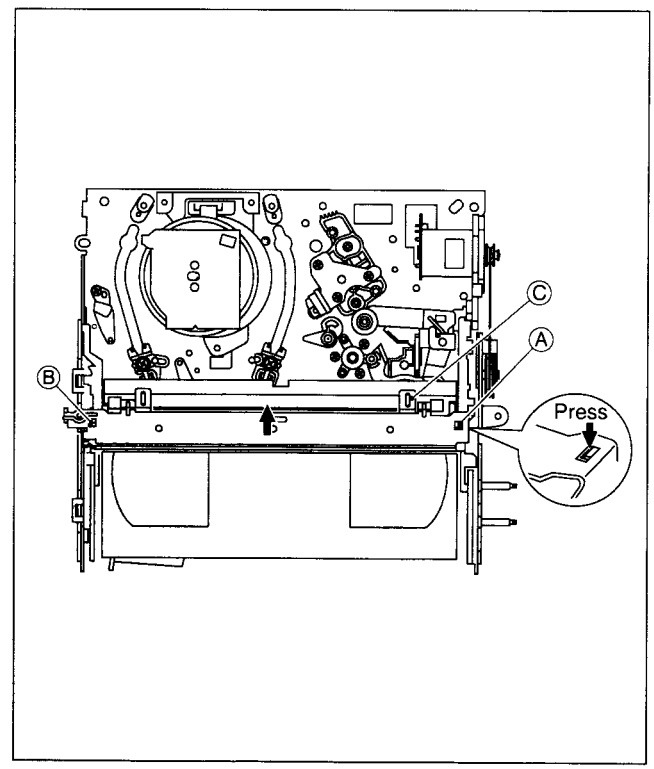


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3.)

(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-4.)

(4) In the same way as in the electrical failure instructions in 2.1.3 (4), remove the top guide.

(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.

(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

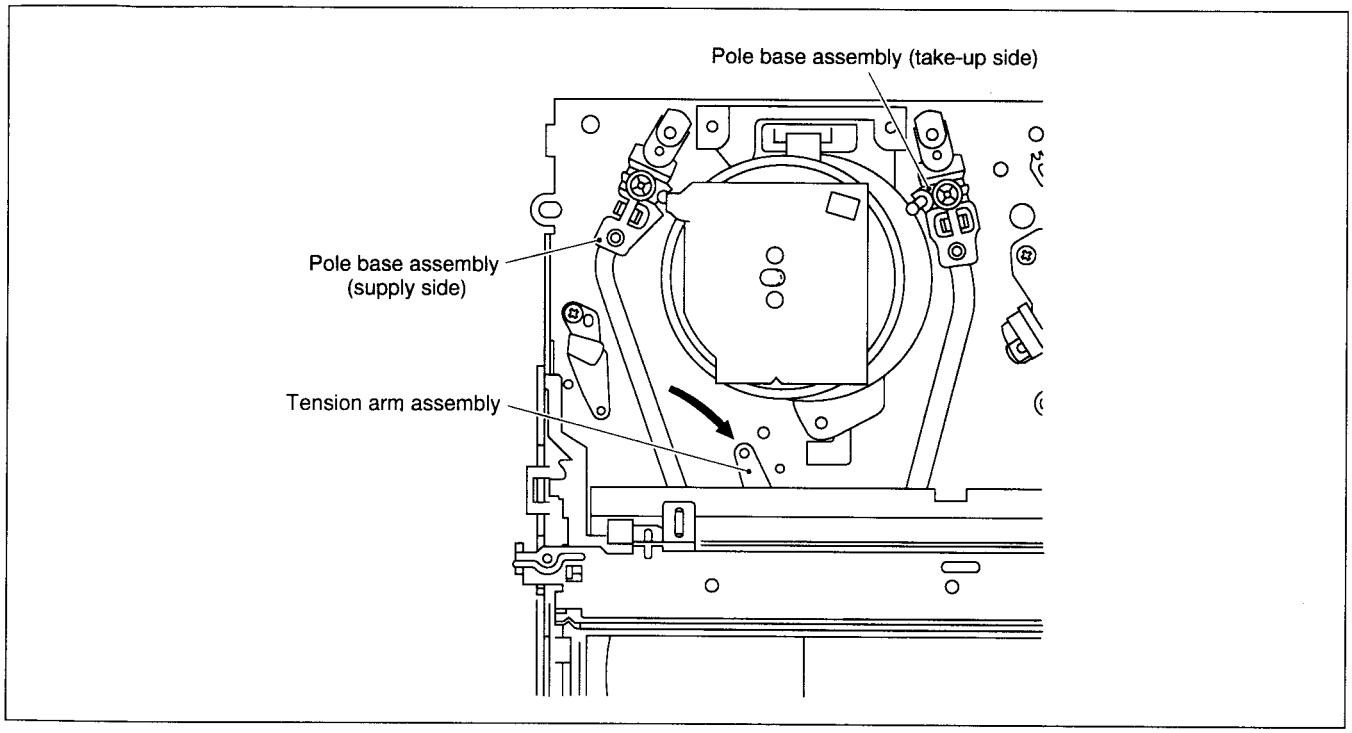


Fig. 2-1-3

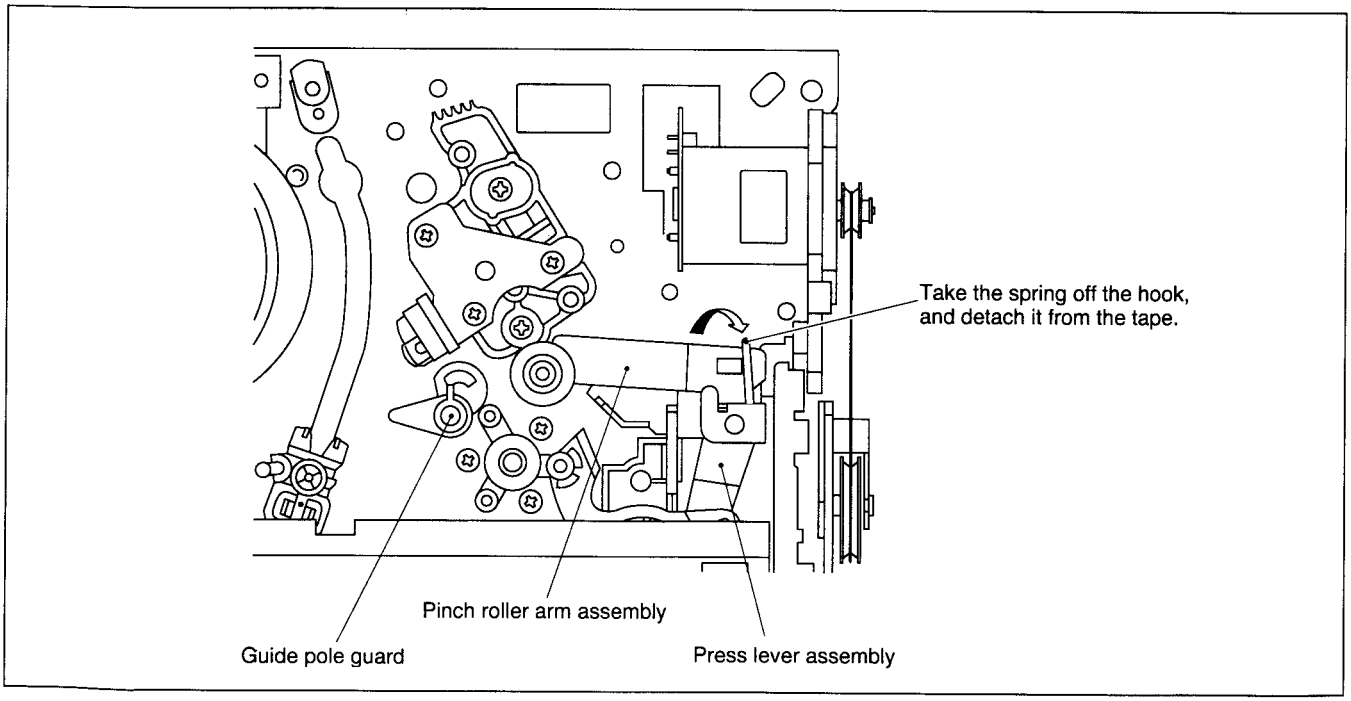


Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

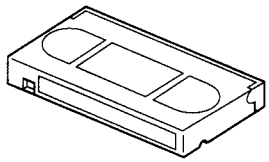
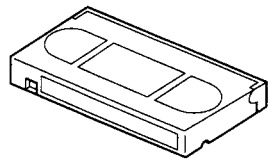
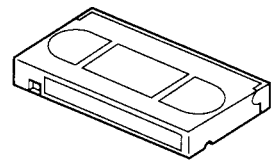
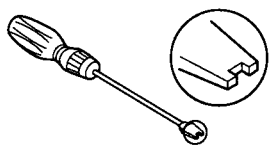
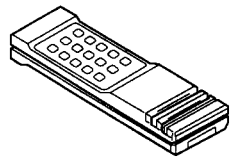
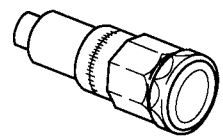
Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

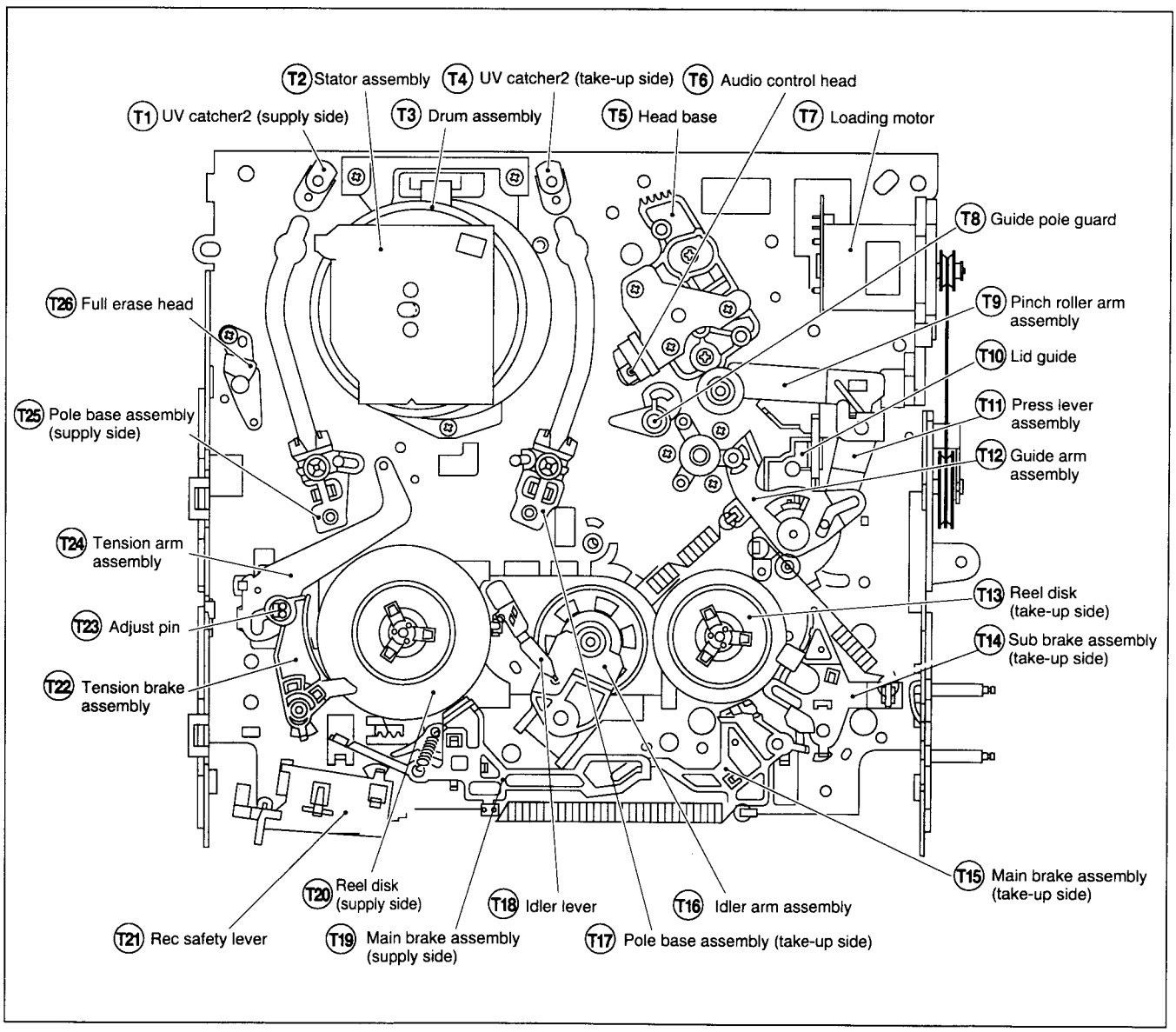

T1 UV catcher2 (supply side)
T2 Stator assembly
T3 Drum assembly
T4 UV catcher2 (take-up side)
T5 Head base
T6 Audio control head
T7 Loading motor
T8 Guide pole guard
T9 Pinch roller arm assembly
T10 Lid guide
T11 Press lever assembly
T12 Guide arm assembly
T13 Reel disk (take-up side)
T14 Sub brake assembly (take-up side)
T15 Main brake assembly (take-up side)
T16 Idler arm assembly
T17 Pole base assembly (take-up side)
T18 Idler lever
T19 Main brake assembly (supply side)
T20 Reel disk (supply side)
T21 Rec safety lever
T22 Tension brake assembly
T23 Adjust pin
T24 Tension arm assembly
T25 Pole base assembly (supply side)
T26 Full erase head

Fig. 2-1-5 Mechanism assembly top side

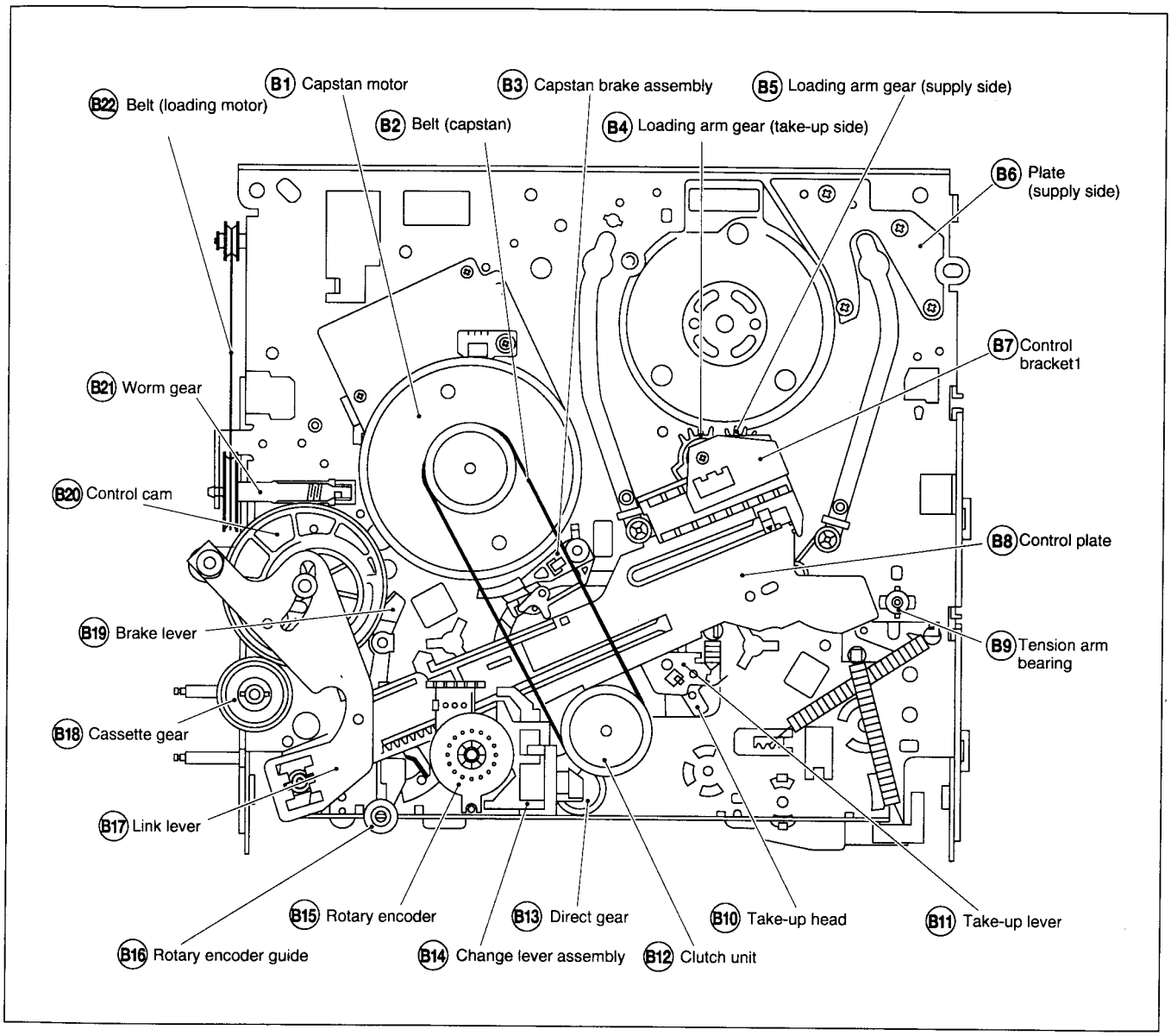


Fig. 2-1-6 Mechanism assembly bottom side

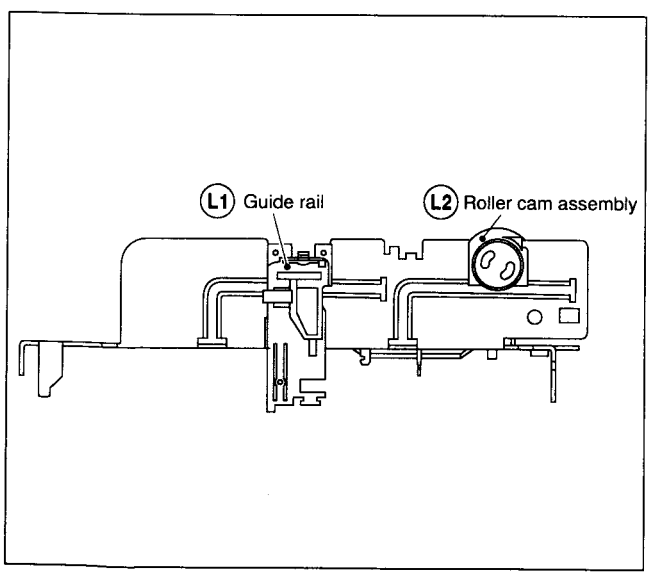


Fig. 2-1-7 Mechanism assembly left side

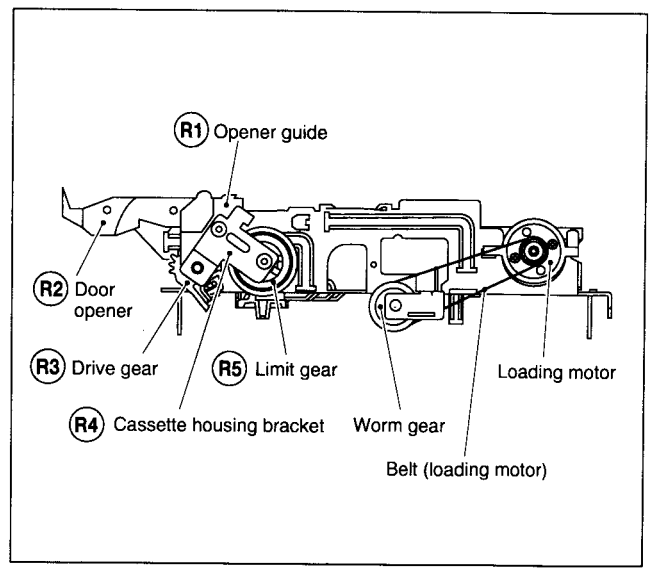


Fig. 2-1-8 Mechanism assembly right side

Note: *This table shows the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.*
The circled numbers (symbols and numbers) preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.

Symbols and numbers	Removal parts / (Reference items) Replacement parts	Front (T)/Back (B) of mechanism	Number of removal steps	(L1) Guide rail	(L2) Roller cam assembly	(R4) Cassette housing bracket	(R1) Opener guide	– Relay gear	– Cassette holder assembly	(R3) Drive gear	– Drive arm	(T9) Pinch roller arm assembly	(T12) Guide arm assembly	(T11) Press lever assembly	(T1)(T4) UV catcher2	(B15) Rotary encoder	(B12) Clutch unit	(B14) Change lever assembly	(B13) Direct gear	(B17) Link lever	(B21) Worm gear	(B7) Control bracket1	(B8) Control plate	(B5) Loading arm gear (supply side)	(B4) Loading arm gear (take-up side)	(B11) Take-up lever	(T14) Sub brake assembly (take-up side)	(T15) Main brake assembly (take-up side)	(T13) Reel disk (take-up side)	(T22) Tension brake assembly	(T24) Tension arm assembly	(T18) Idler lever	(B19) Brake lever
(L1)	2.2.3 Guide rail	T	1																														
(L2)	2.2.3 Roller cam assembly	T	1																														
(R4)	2.2.3 Cassette housing bracket	T	1																														
(R1)	2.2.3 Opener guide	T	2			1																											
(R2)	2.2.3 Door opener	T	3			1	2																										
–	2.2.3 Relay gear	T	3			1	2																										
(R5)	2.2.3 Limit gear	T	3			1	2																										
–	2.2.3 Cassette holder assembly	T	6	1	2	3	4	5																									
(R3)	2.2.3 Drive gear	T	4			1	2	3																									
–	2.2.3 Drive arm	T	8	1	2	3	4	5	6	7																							
(T9)	2.2.4 Pinch roller arm assembly	T	1																														
(T12)	2.2.5 Guide arm assembly	T	1																														
(T11)	2.2.5 Press lever assembly	T	3									1	2																				
(T6)	2.2.6 Audio control head	T	1																														
(T7)	2.2.7 Loading motor	T	1																														
(B1)	2.2.8 Capstan motor	T/B	1																														
(T1)(T4)	2.2.9 UV catcher2	T	1																														
(T17)	2.2.9 Pole base assembly (take-up side)	T/B	2												1																		
(T25)	2.2.9 Pole base assembly (supply side)	T/B	2												1																		
(B15)	2.2.10 Rotary encoder	B	1																														
(B12)	2.2.11 Clutch unit	B	1																														
(B14)	2.2.12 Change lever assembly	B	3													1	2																
(B13)	2.2.12 Direct gear	B	4													1	2	3															
–	2.2.12 Clutch gear1	B	5													1	2	3	4														
(B17)	2.2.13 Link lever	B	1																														
(B18)	2.2.14 Cassette gear	B	2																	1													
(B20)	2.2.14 Control cam	B	2																	1													
(B21)	2.2.14 Worm gear	B	1																														
(T10)	- Lid guide	T/B	5									1	2	3							4												
(B7)	2.2.15 Control bracket1	B	1																														
(B8)	2.2.15 Control plate	B	6													1	2	3		4		5											
(B5)	2.2.16 Loading arm gear (supply side)	B	7													1	2	3		4		5	6										
(B4)	2.2.16 Loading arm gear (take-up side)	B	8													1	2	3		4		5	6	7									
–	2.2.16 Loading arm gear shaft	B	9													1	2	3		4		5	6	7	8								
(B11)	2.2.17 Take-up lever	T/B	7													1	2	3		4		5	6										
(B10)	2.2.17 Take-up head	T/B	8													1	2	3		4		5	6			7							
–	2.2.17 Control plate guide	T/B	8													1	2	3		4		5	6			7							
(B3)	2.2.18 Capstan brake assembly	T/B	7													1	2	3		4		5	6										
(T14)	2.2.19 Sub brake assembly(take-up side)	T/B	15	1	2	3	4	5	6	7	8					9	10	11		12		13	14										
(T15)	2.2.20 Main brake assembly(take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T19)	2.2.20 Main brake assembly(supply side)	T/B	9	1	2	3	4	5	6	7	8																						
(T13)	2.2.20 Reel disk (take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T22)	2.2.21 Tension brake assembly	T/B	9	1	2	3	4	5	6	7	8																						
(T20)	2.2.21 Reel disk (supply side)	T/B	10	1	2	3	4	5	6	7	8																				9		
(T24)	2.2.21 Tension arm assembly	T/B	10	1	2	3	4	5	6	7	8																				9		
(B9)	2.2.21 Tension arm bearing	T/B	10	1	2	3	4	5	6	7	8																				9		
(T18)	2.2.22 Idler lever	T/B	17	1	2	3	4	5	6	7	8					9	10	11		12		13	14								15	16	
(T16)	2.2.22 Idler arm assembly	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14								15	16	17
(B19)	- Brake lever	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				
(B16)	- Rotary encoder guide	T/B	19	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				18

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake assembly		○
	Main brake assembly		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear		○
	Control plate		○
Other	Brush	★○	★○
	Tension brake assembly	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

(For information on phase matching of the mechanism, see the instructions on how to install individual parts.)

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembling chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1.)

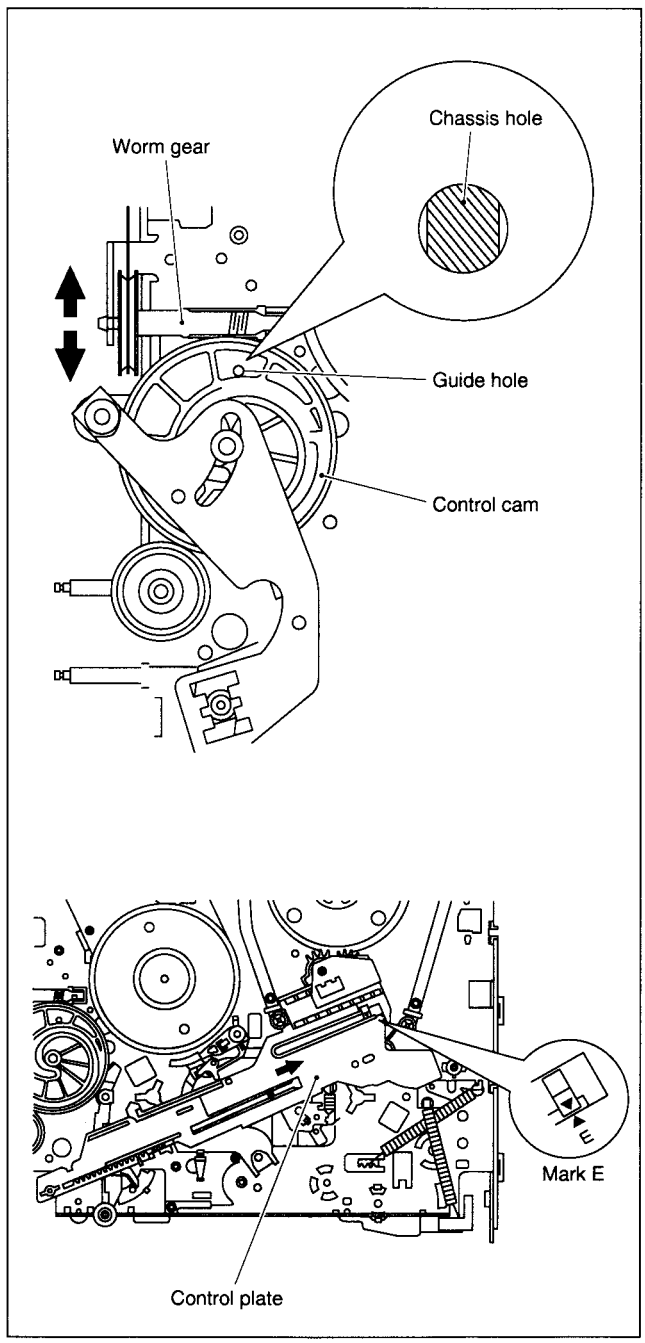


Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-2.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

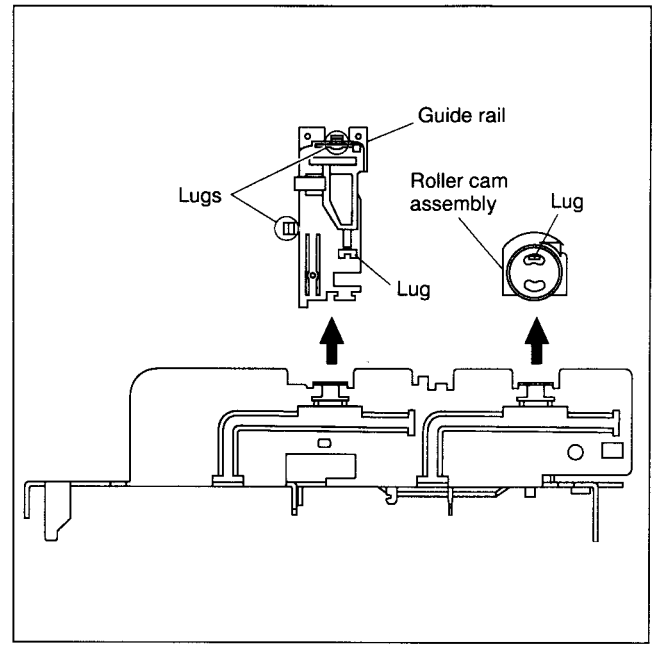


Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3.)
(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3.)

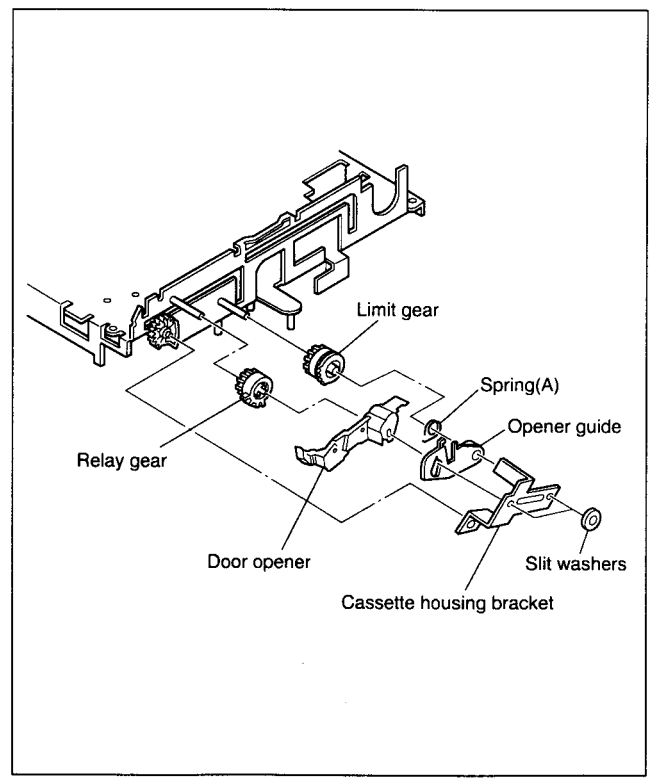


Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-4.)

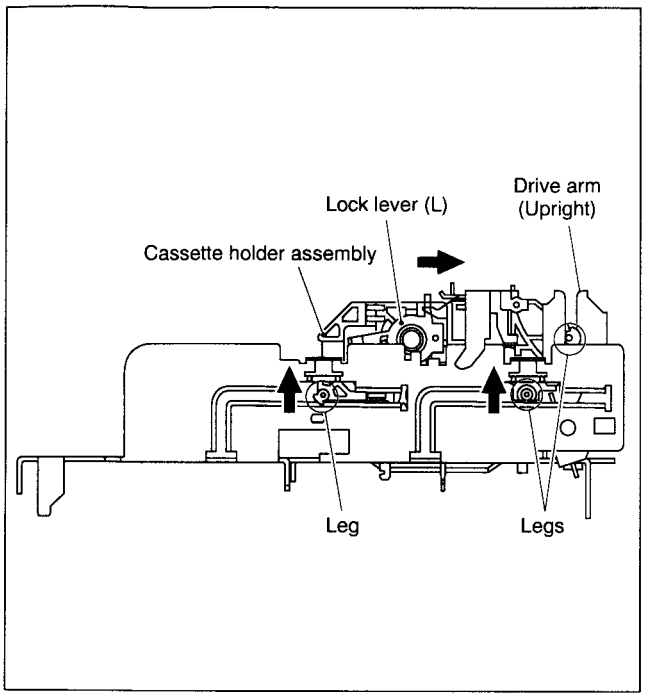


Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5 and Fig.2-2-6.)

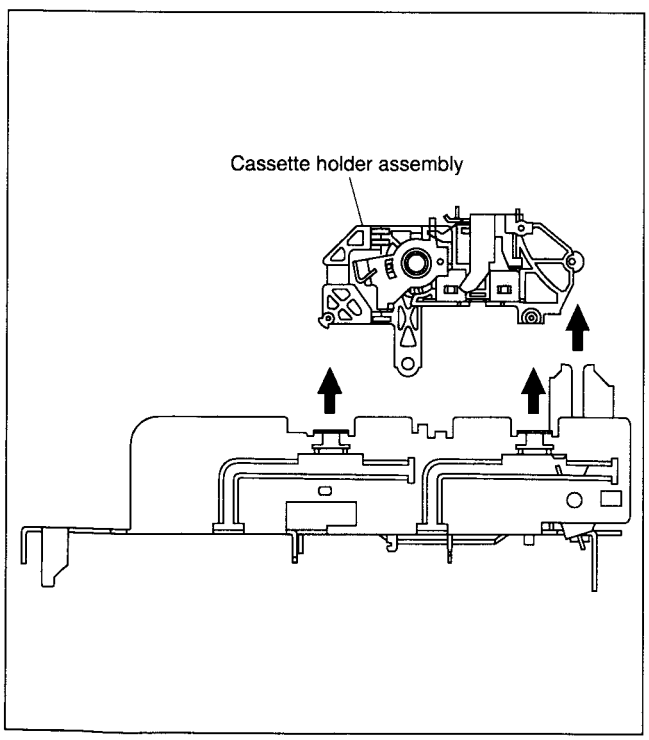


Fig. 2-2-5

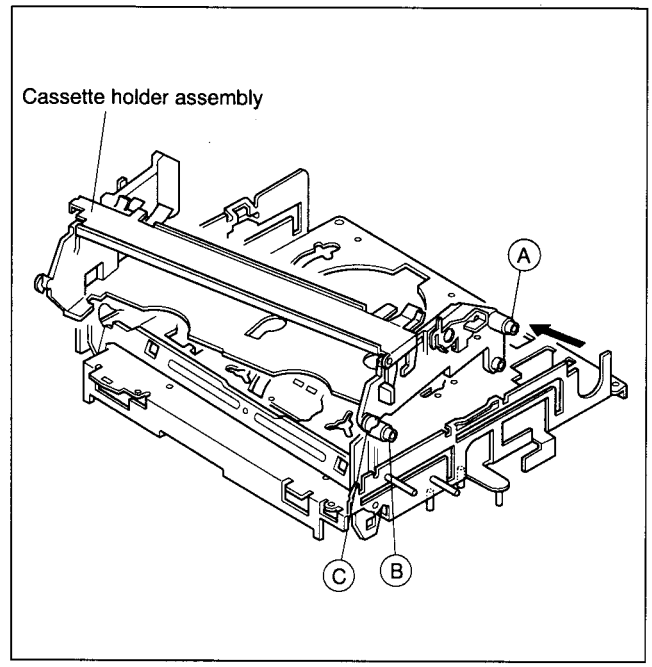


Fig. 2-2-6

(6) Draw out the drive gear, and remove the drive arm.

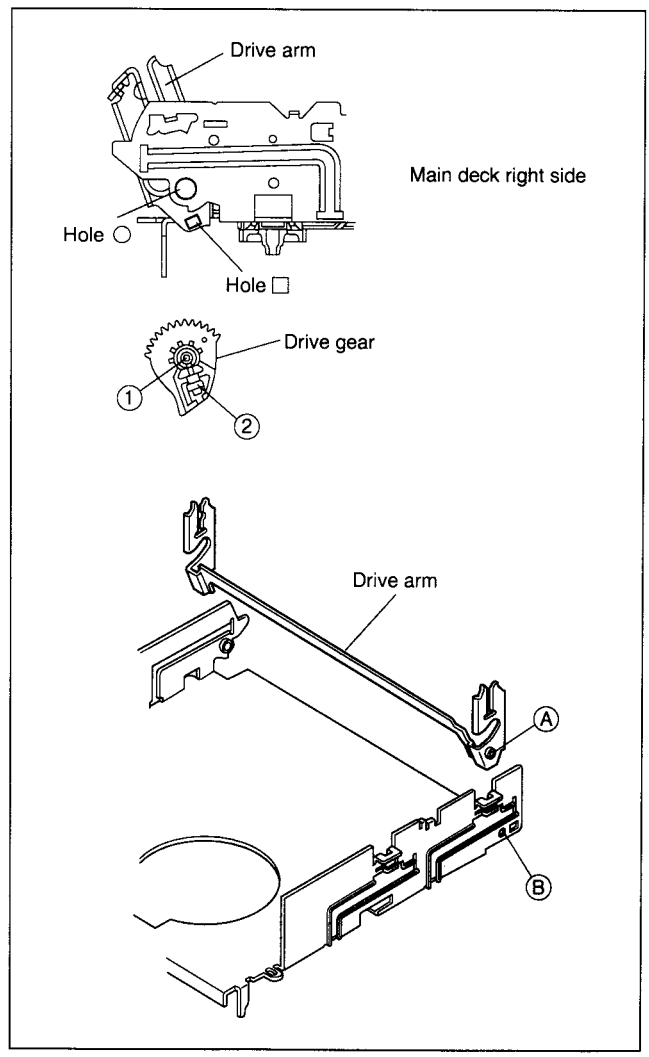


Fig. 2-2-7

2. How to install (Phase matching)

(1) Insert the section Ⓐ of the drive arm into the section Ⓑ of the main deck.

(2) Insert the section ① of the drive gear into the round hole, and the section ② into the square hole on the drive arm. (See Fig.2-2-7.)

(3) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-8.)

(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-8.)

(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-9.)

(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.

(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-10.)

(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-10.)

(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

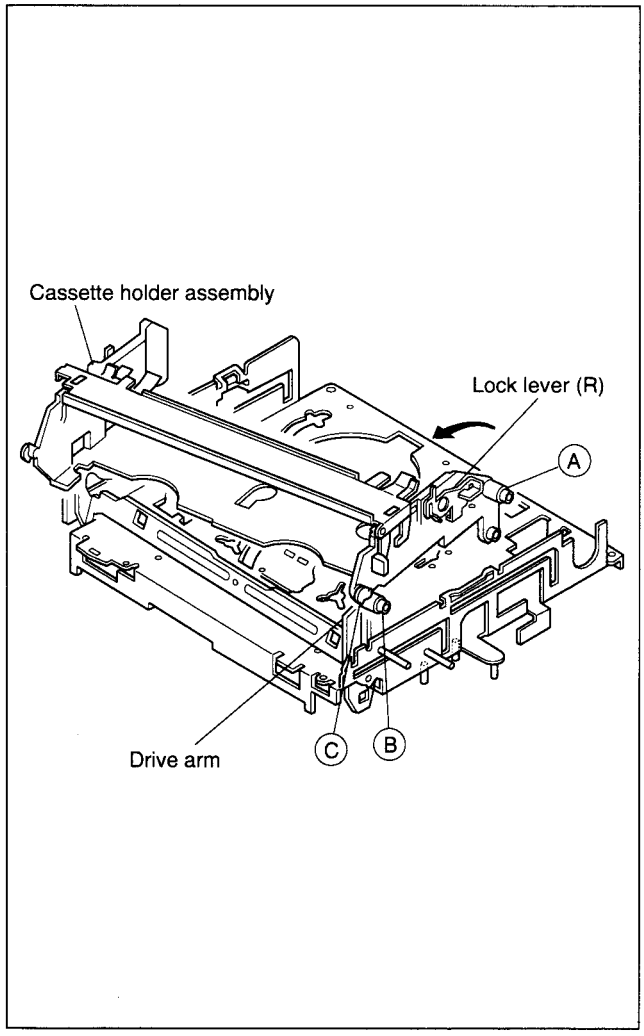


Fig. 2-2-8

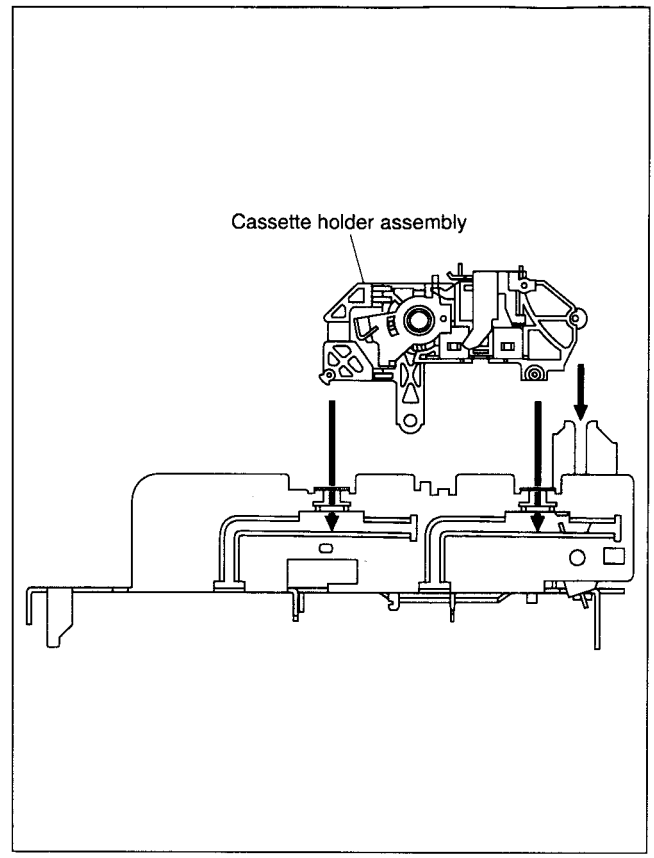


Fig. 2-2-9

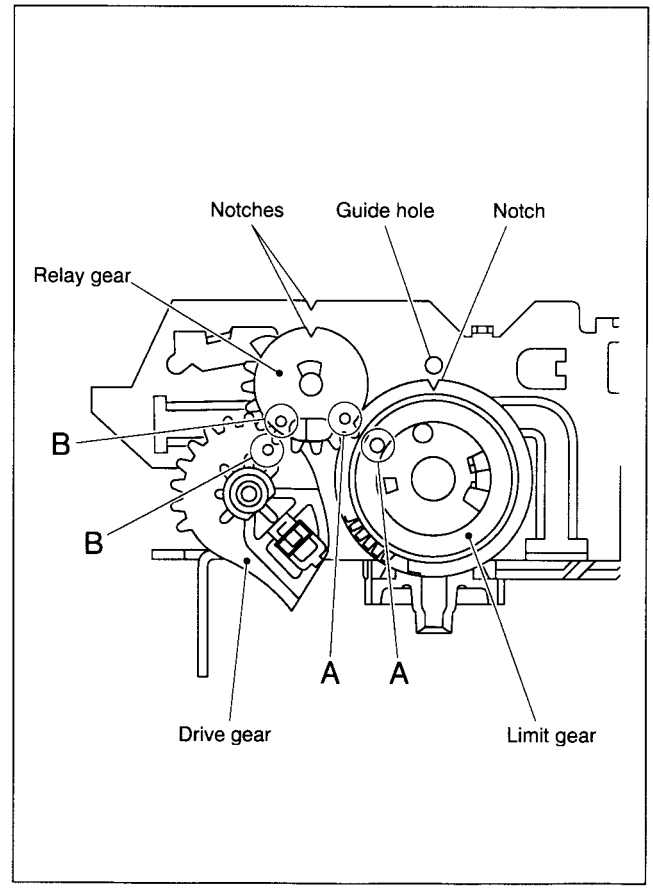


Fig. 2-2-10

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever assembly.
(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-11.)
(3) Remove the pinch roller arm assembly by pulling it up.

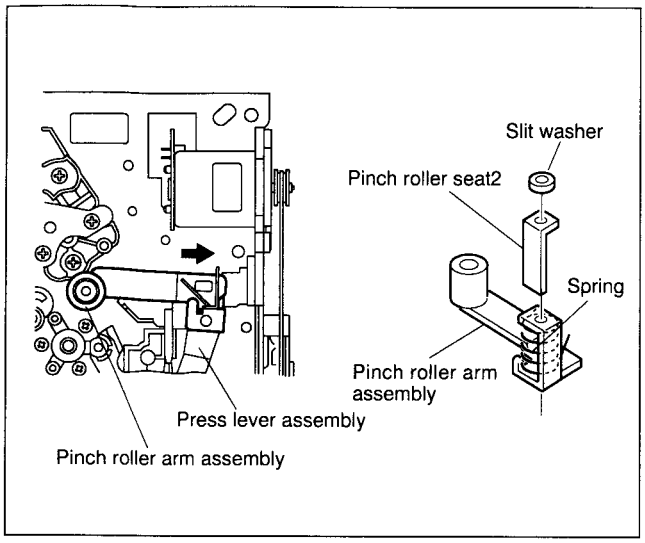


Fig. 2-2-11

2.2.5 Guide Arm Assembly and Press Lever Assembly

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.
(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-12.)

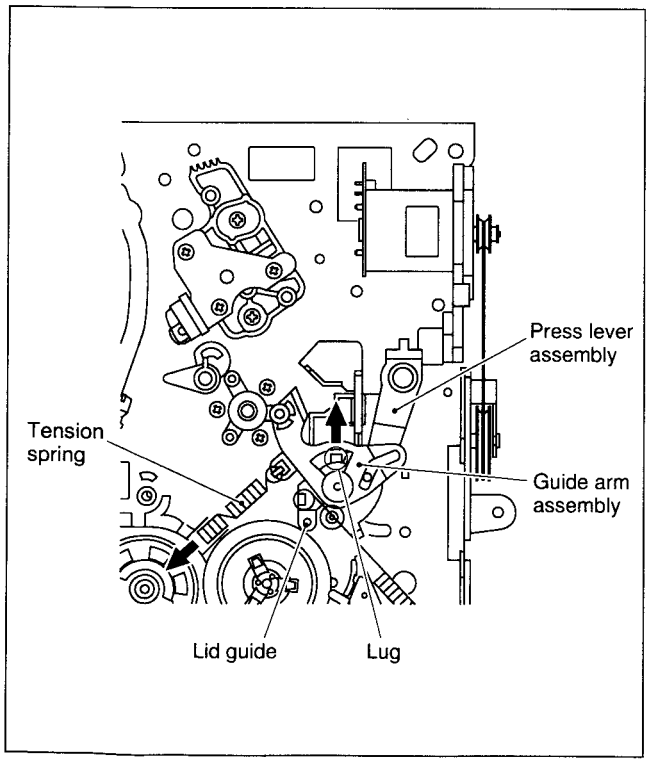


Fig. 2-2-12

2.2.6 Audio Control Head

1. How to remove

(1) Remove the two screws (A) and remove the audio control head together with the head base.

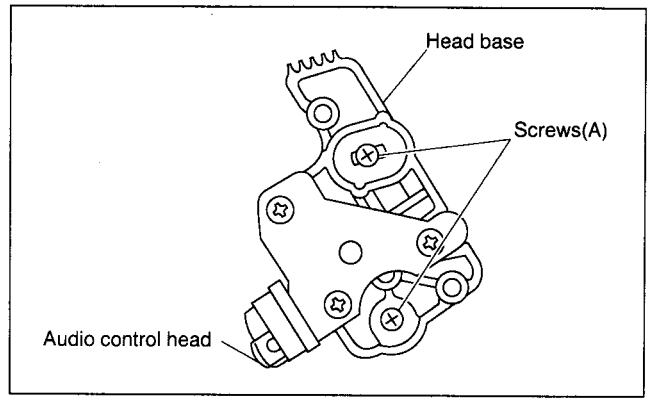


Fig. 2-2-13

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

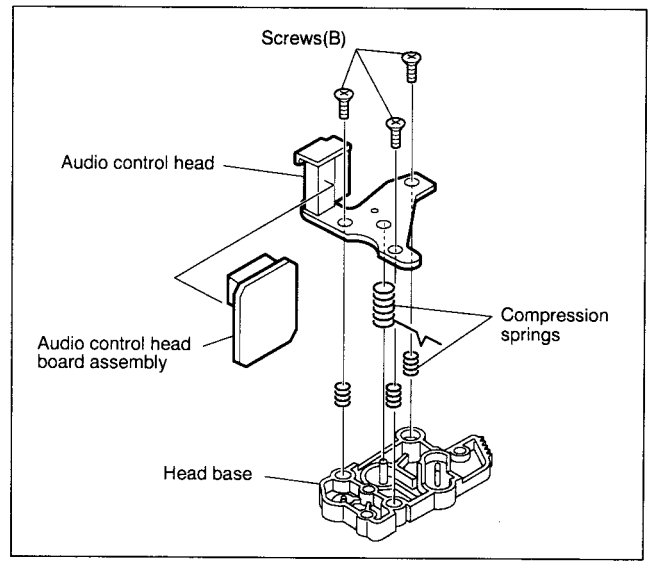


Fig. 2-2-14

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-15. Also make sure that the screw center is brought into alignment with the center position of the slot.

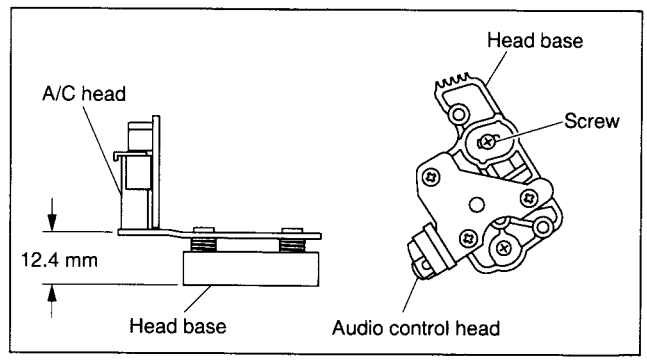


Fig. 2-2-15

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.
(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.
(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)
(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-16.

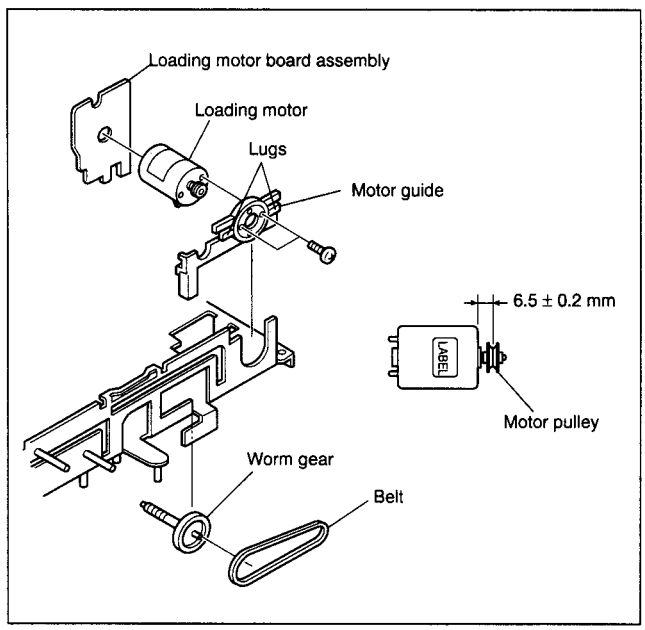


Fig. 2-2-16

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the mechanism assembly back side.
(2) Remove the three screws (A) and remove the capstan motor.

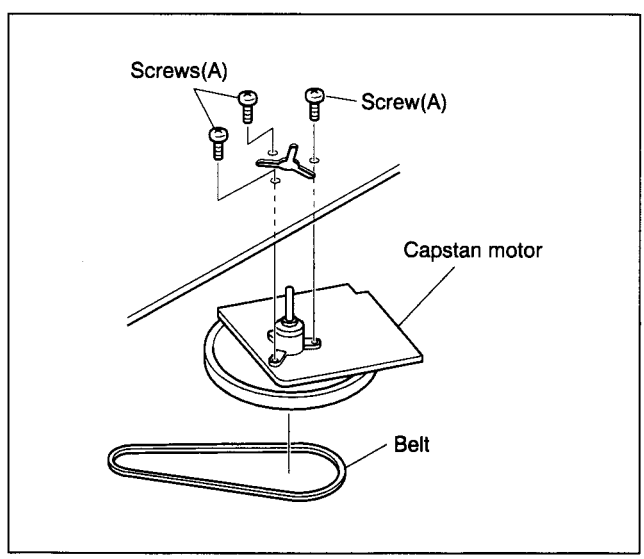


Fig. 2-2-17

2. How to install (Centering the mounting position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.
(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.
(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.)
Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-18.

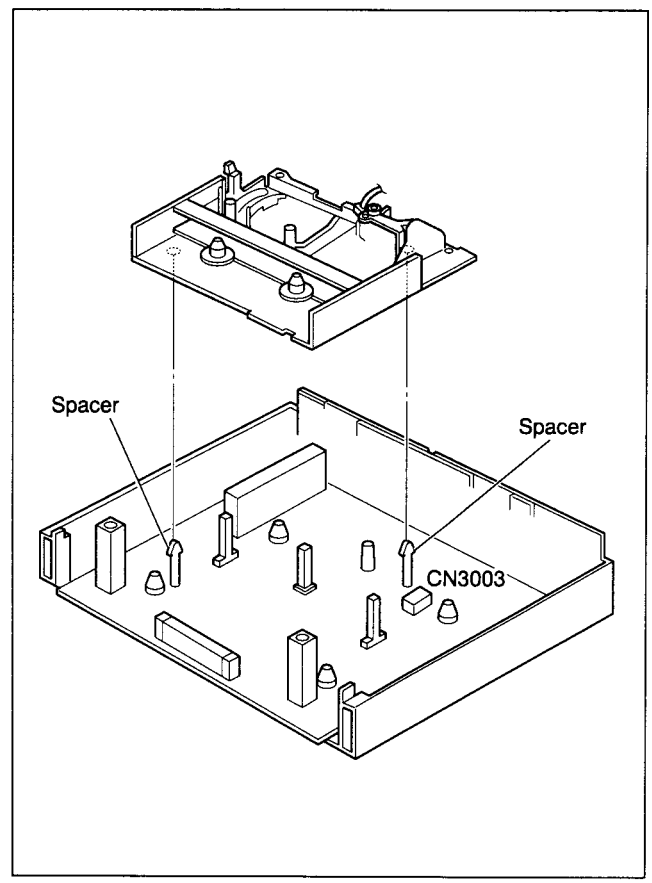


Fig. 2-2-18

(3) Making sure that the connector CN3003 of the capstan motor is correctly mounted, and securely tighten the three screws (A).

Note: *When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).*

2.2.9 Pole Base Assembly (supply or take-up side)

1. How to remove

(1) Remove the UV catcher 2 on the removal side by loosening the screw (A).

(2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.

(3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the "Procedures for Lowering the Cassette holder assembly" of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

NOTE: *After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.*

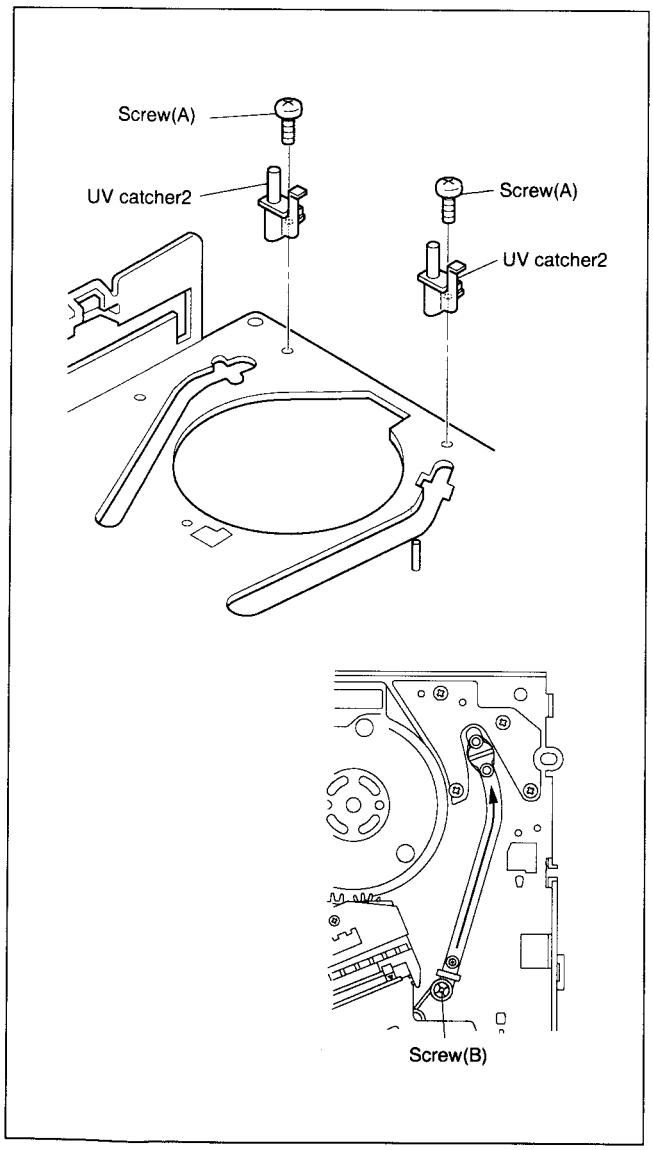


Fig. 2-2-19

2.2.10 Rotary Encoder

1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-20.)

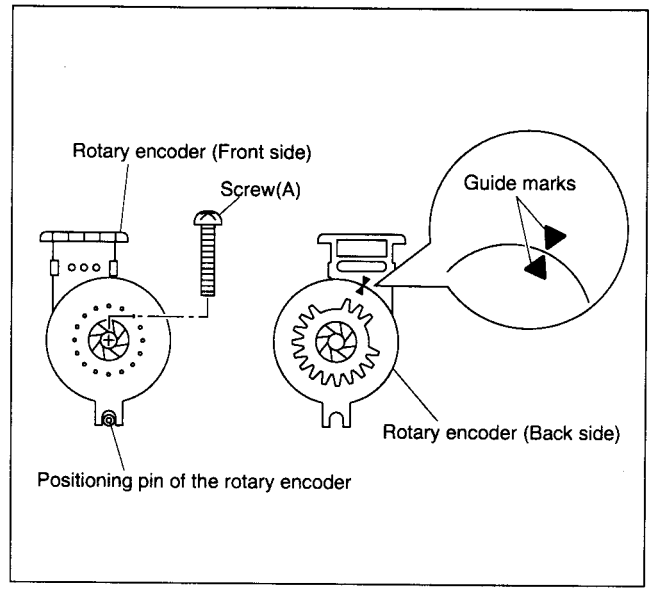


Fig. 2-2-20

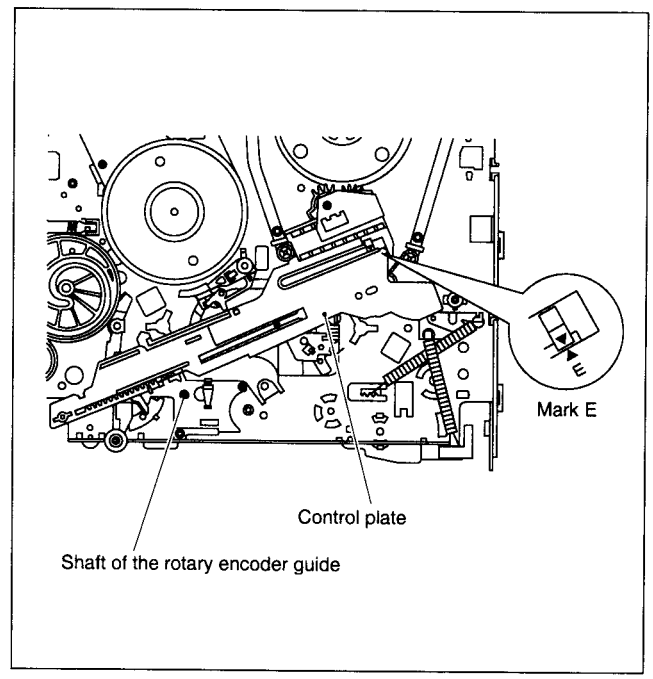


Fig. 2-2-21

2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-20. (See Fig. 2-2-20 and Fig. 2-2-21.)

(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.
(2) Remove the slit washer and remove the clutch unit.

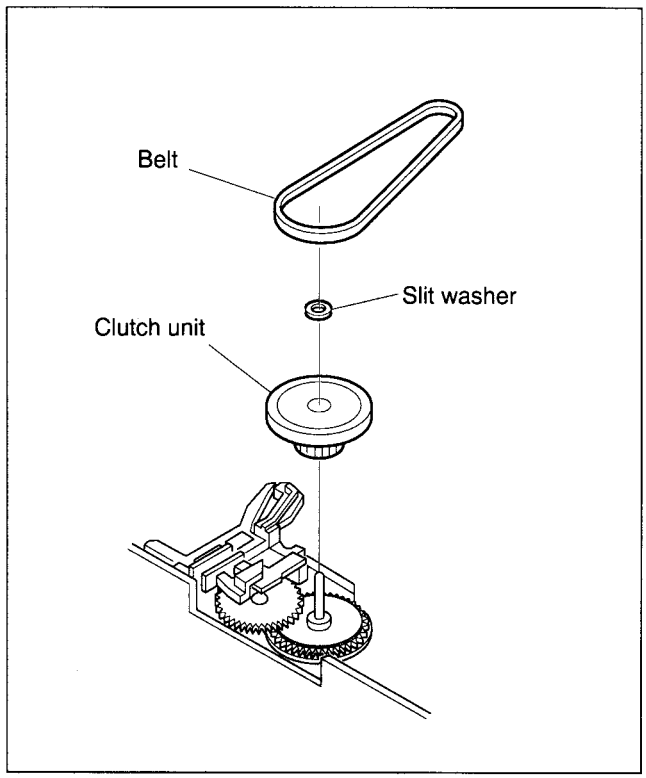


Fig. 2-2-22

2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1

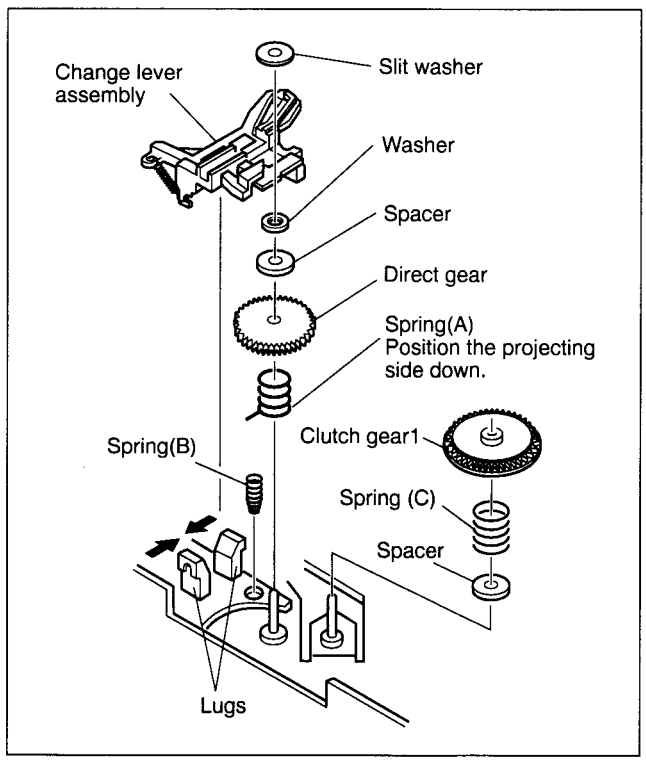


Fig. 2-2-23

1. How to remove

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.
(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-23.)

2. How to install

(1) Install the clutch gear1, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-23.)
(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the clutch gear1 and catch it from the both sides with the assembly. (See Fig.2-2-24.)

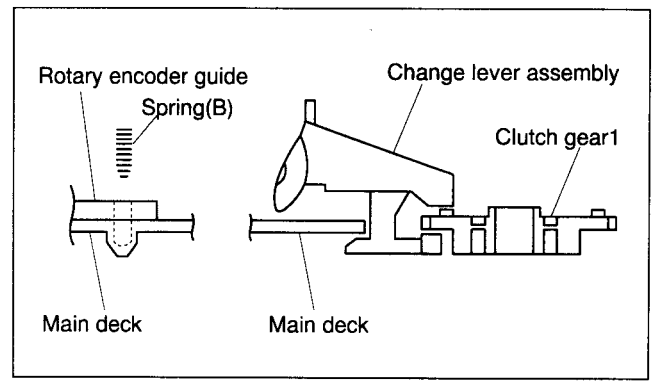


Fig. 2-2-24

2.2.13 Link Lever

1. How to remove

(1) Remove the two slit washers.
(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

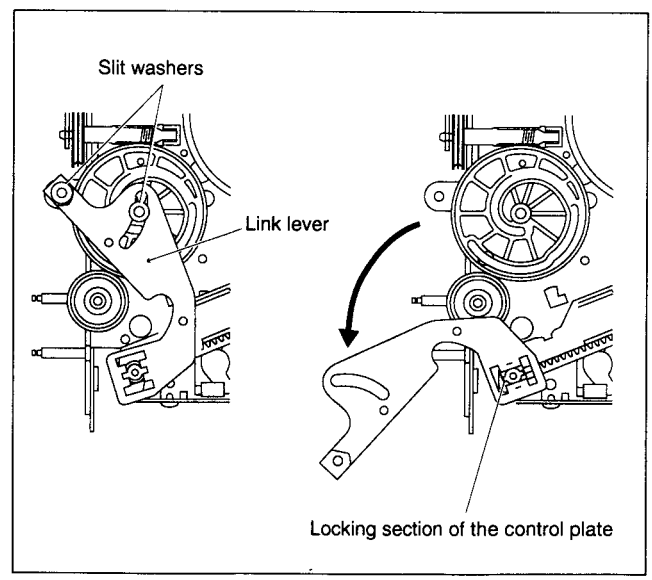


Fig. 2-2-25

2. How to install (Phase matching)

(1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-26.)
(2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-27.)
(3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-25.)
(4) Rotate the link lever clockwise so that it is installed on the shafts in the center and on the left of the control cam.
(5) Fasten the slit washers at these two points.

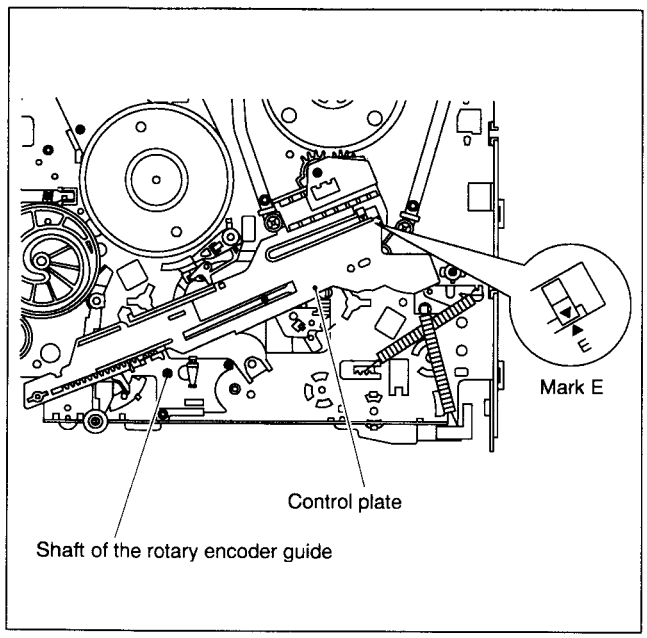


Fig. 2-2-26

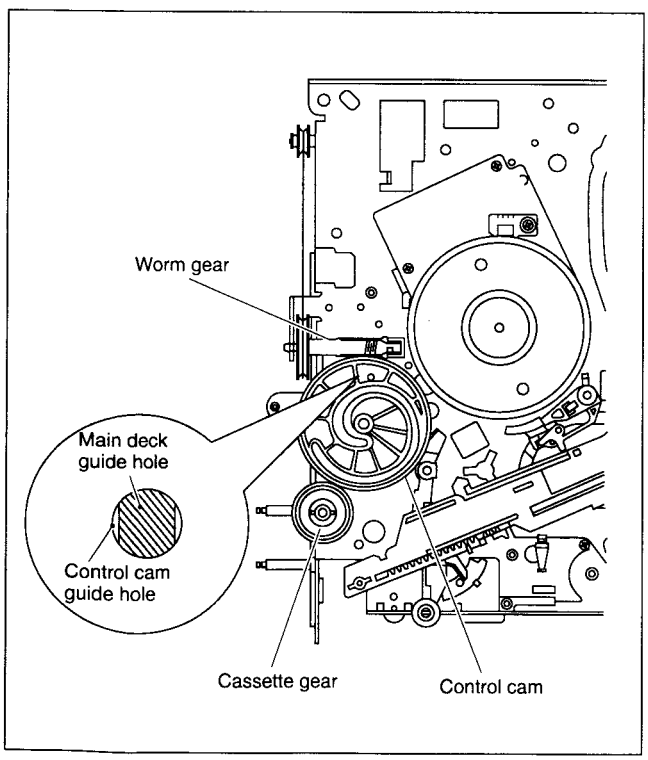


Fig. 2-2-27

2.2.14 Cassette Gear, Control Cam and Worm Gear

1. How to remove

(1) Remove the control cam by lifting it.
(2) Open the two lugs of the cassette gear outward and pull the latter off.
(3) Remove the belt wound around the worm gear and the loading motor.
(4) Open the lug of the lid guide outward and remove the worm gear.

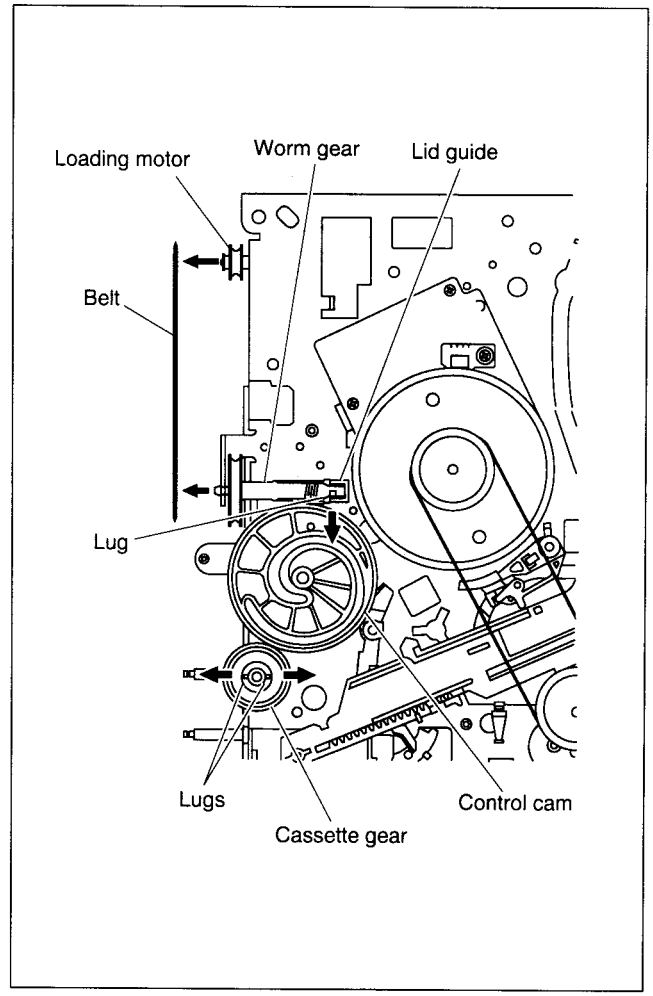


Fig. 2-2-28

2.2.15 Control Plate

1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.
(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-29.)

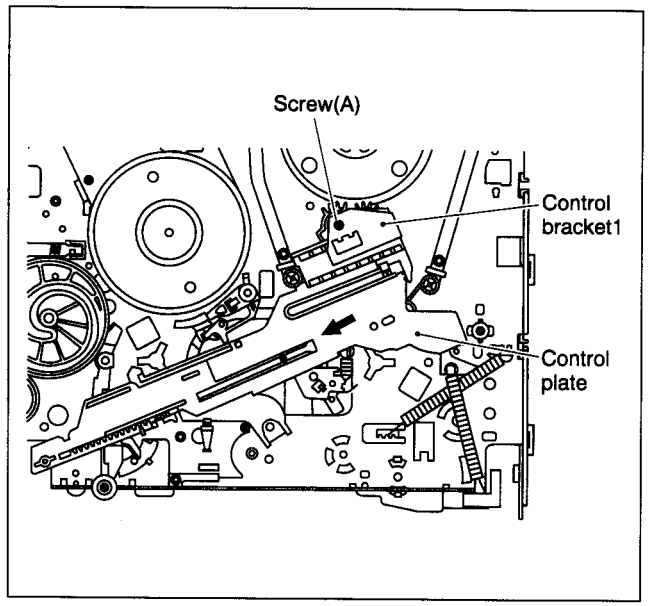


Fig. 2-2-29

2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-30 (to the left of centre of the R section).

(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-31.)

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-31.)

(5) Pull off the hexagonal wrench for positioning.

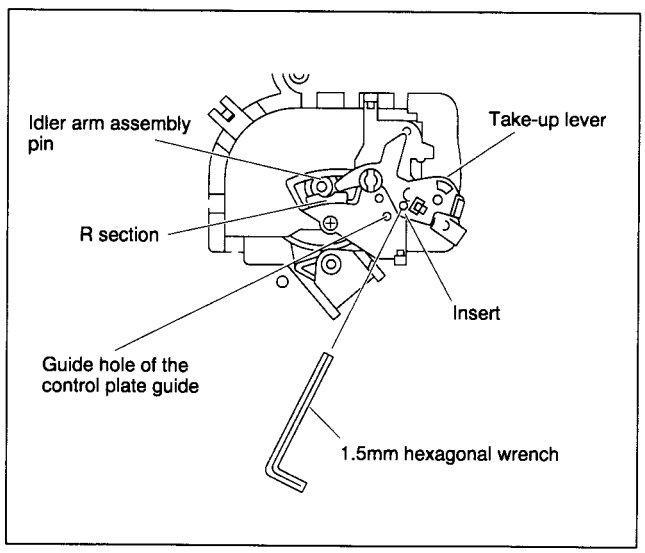


Fig. 2-2-30

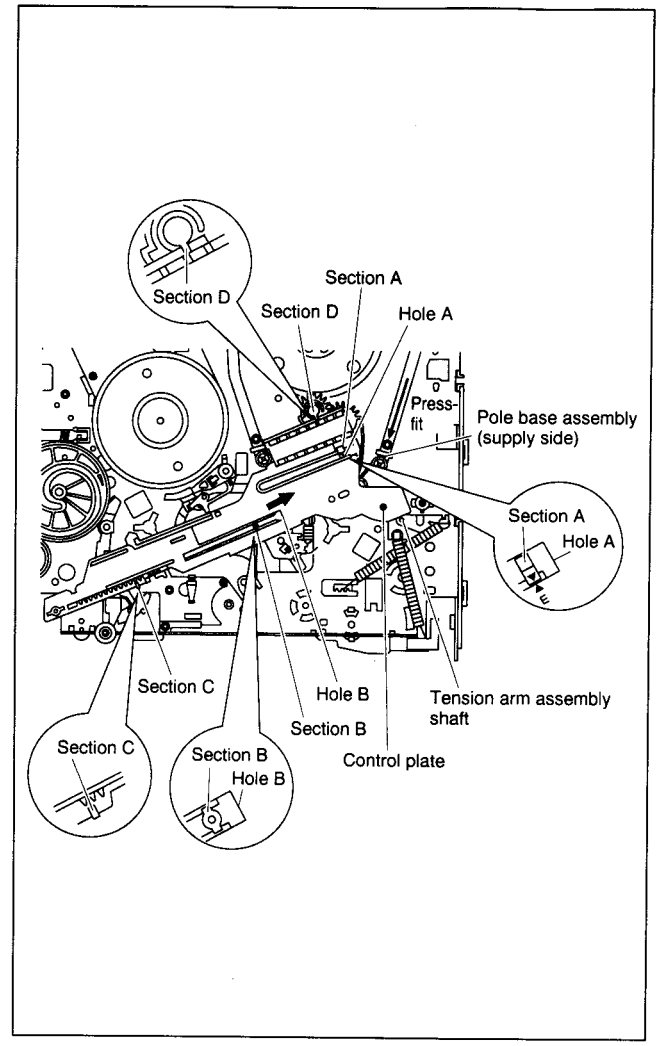


Fig. 2-2-31

2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-32.)

(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-32.)

(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-32 and Fig. 2-2-33.)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

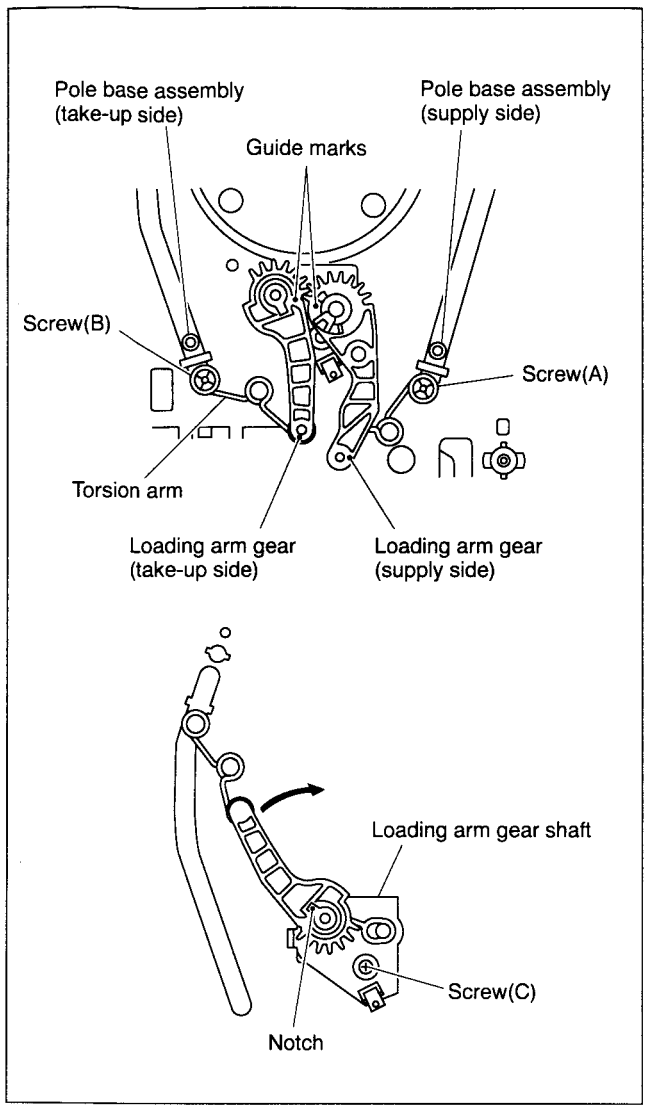


Fig. 2-2-32

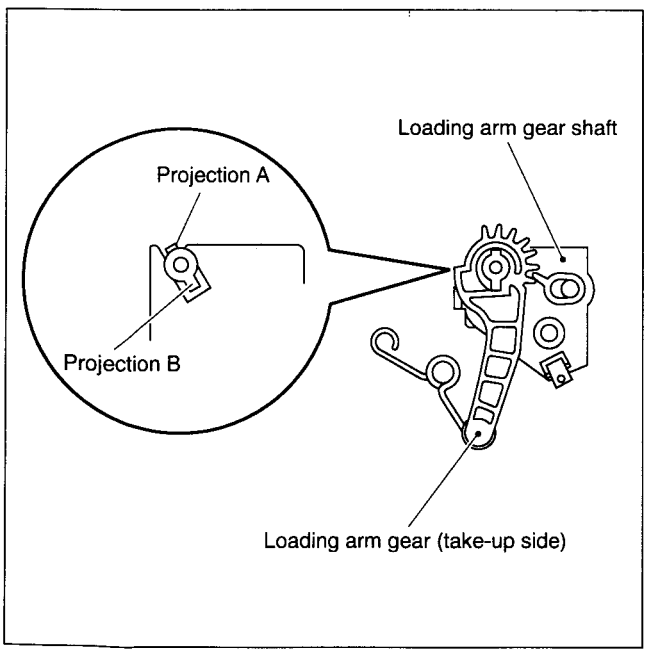


Fig. 2-2-33

2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-33.)

(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).

(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-32.)

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove the screw (A).

(4) Align the idler arm assembly pin in the center of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

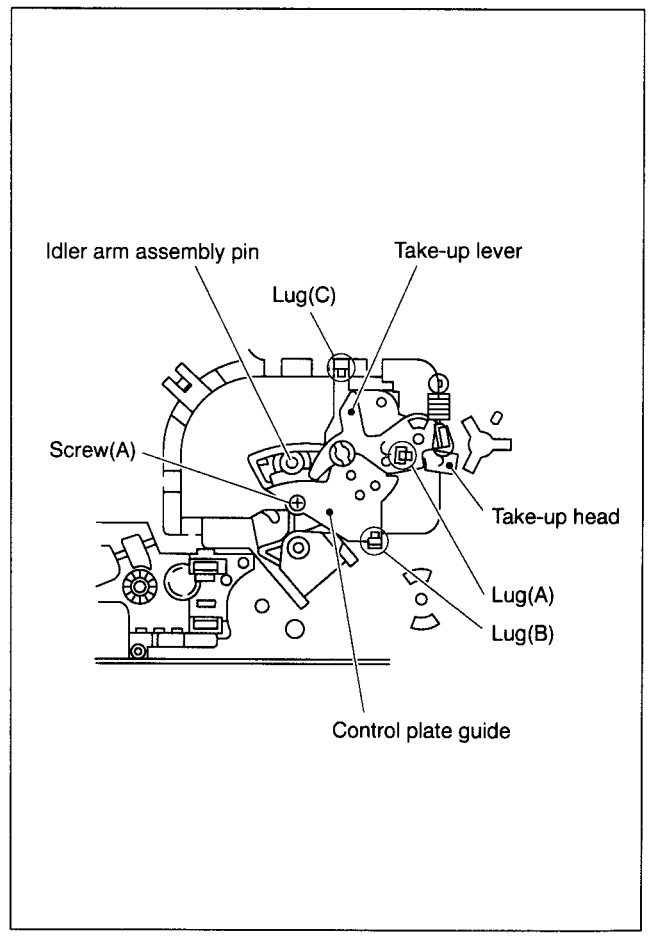


Fig. 2-2-34

2.2.18 Capstan Brake Assembly

1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-35.)

(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.

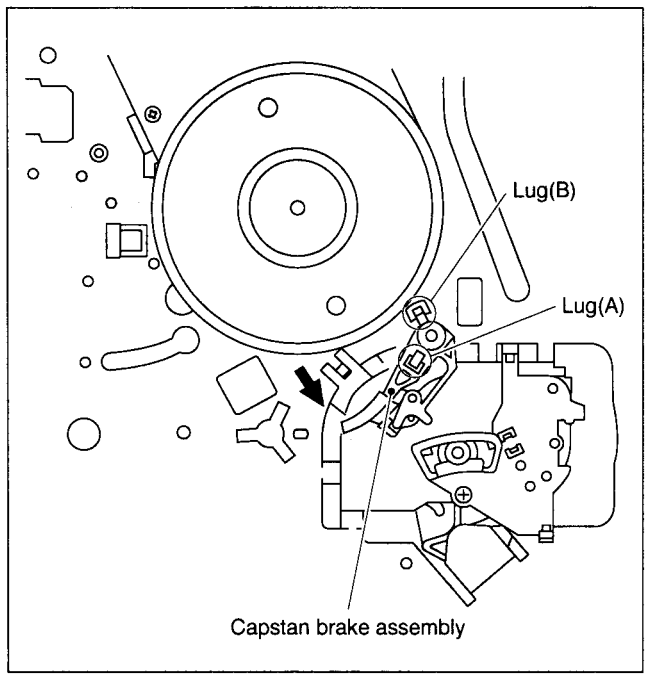


Fig. 2-2-35

2.2.19 Sub Brake Assembly (take-up side)

1. How to remove

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).

(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.

(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).

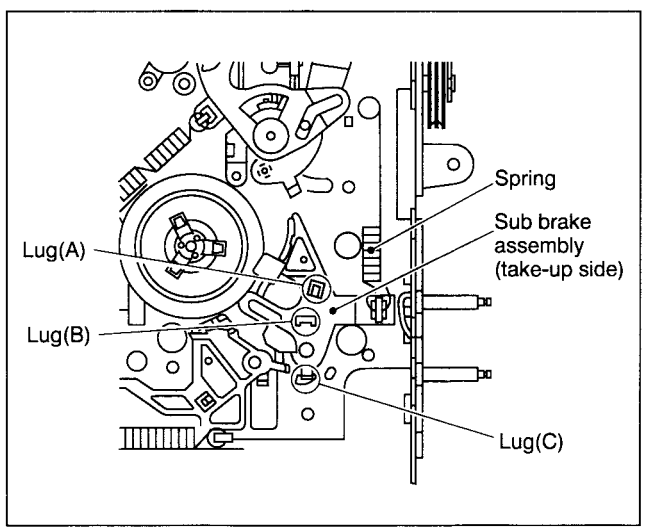


Fig. 2-2-36

2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side)

1. How to remove

(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).

(2) Remove the spring attached to the main brake assembly.

(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.

(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-37.)

Note: *If the main brake assembly is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake assembly torque. See page 2-23 for the detailed adjustment procedures.

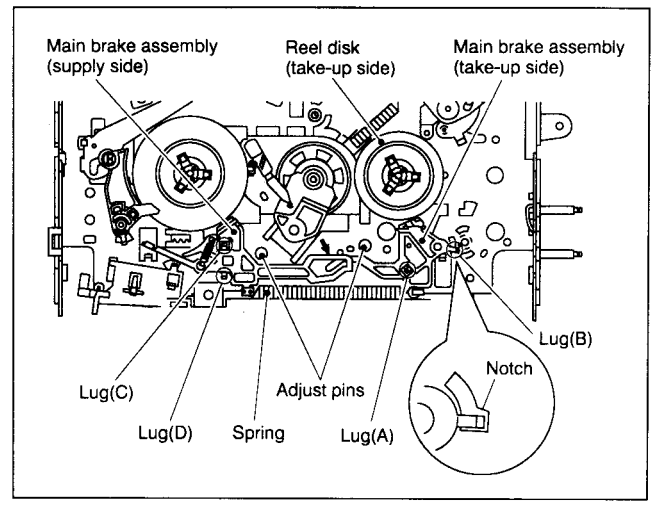


Fig. 2-2-37

(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-38.)

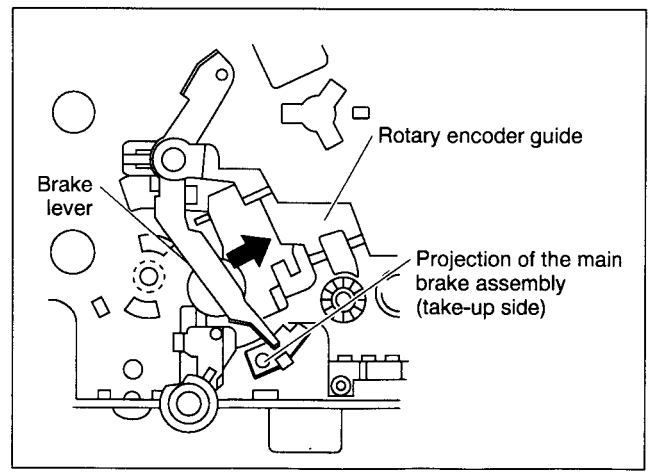


Fig. 2-2-38

2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly

1. How to remove

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.
(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).
(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-39.)

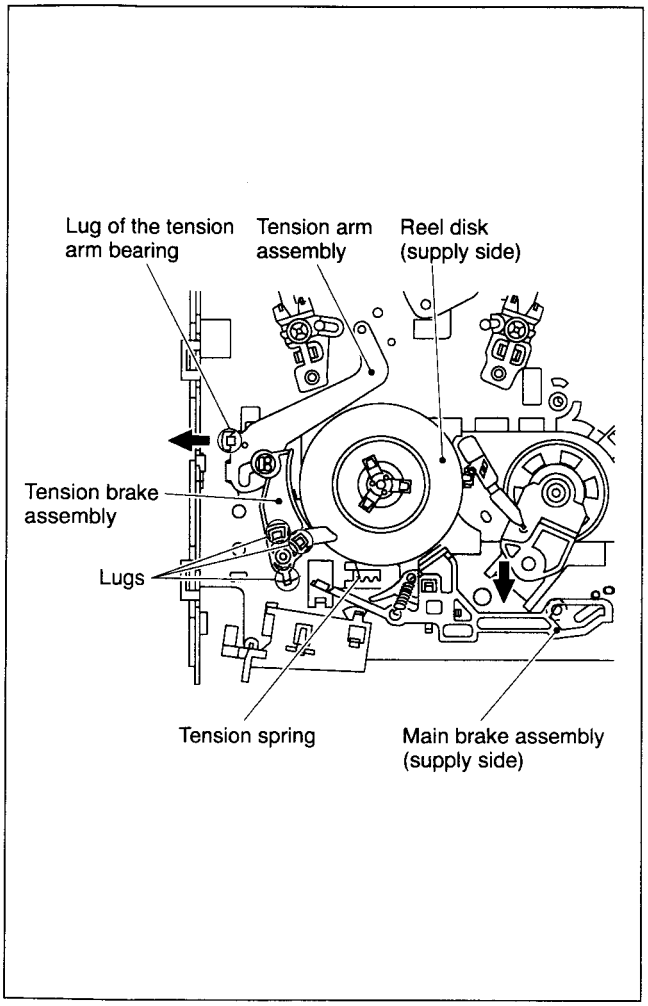


Fig. 2-2-39

2.2.22 Idler Lever, Idler Arm Assembly

1. How to remove

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.
(2) Remove the slit washer and pull out the idler arm assembly.

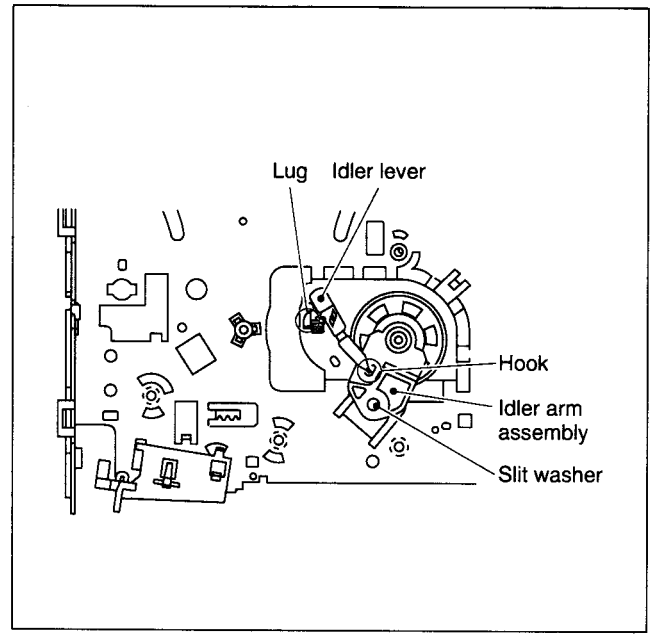


Fig. 2-2-40

2.2.23 Stator Assembly

(1) Remove the flat cable.
(2) Remove the two screws (A).
(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)
(4) After installation, be sure to perform the PB switching point adjustment according to the electrical adjustment procedure.

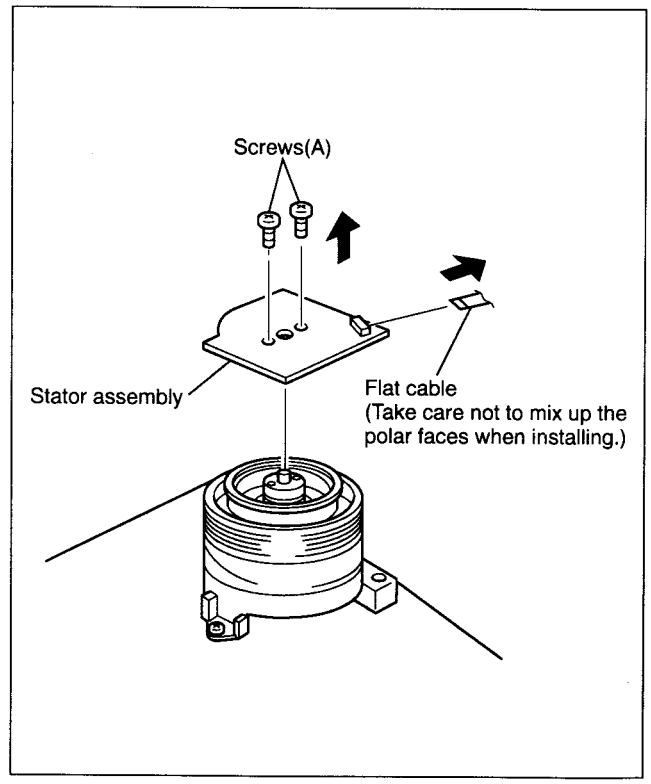


Fig. 2-2-41

2.2.24 Rotor Assembly

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

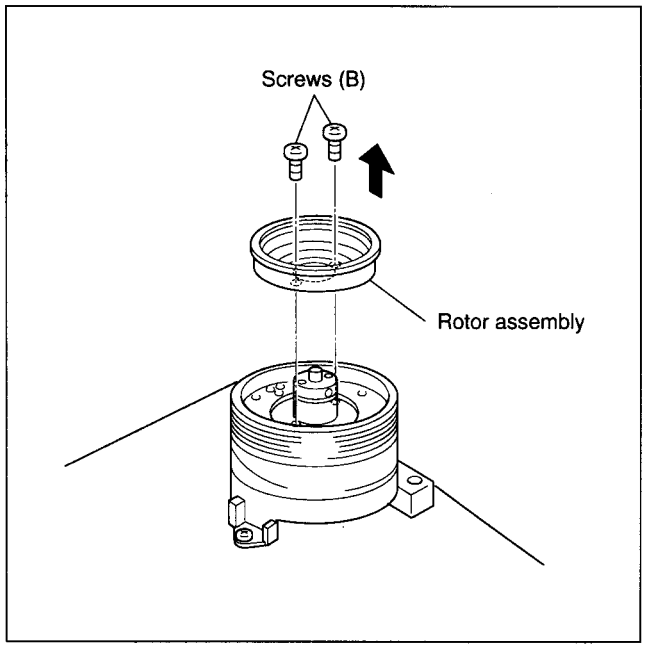


Fig. 2-2-42

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-43.
(4) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-43.)

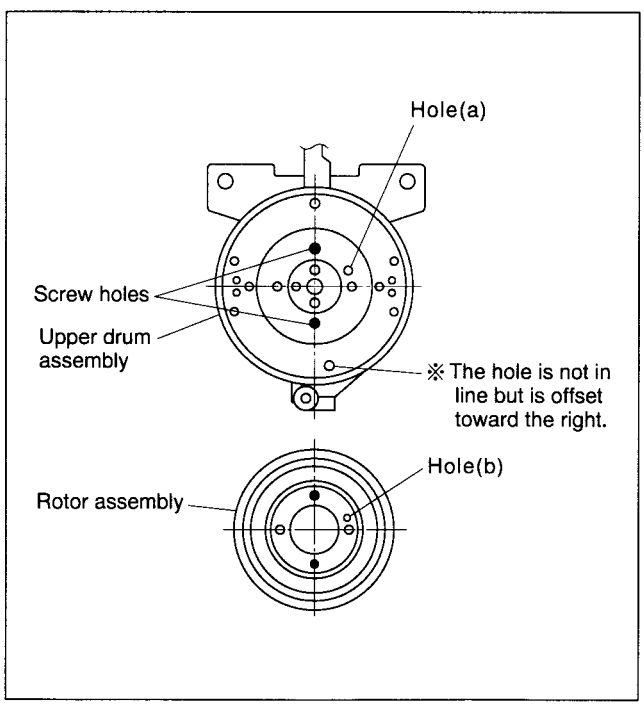


Fig. 2-2-43

2.2.25 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: *When replacement is required, control the up-down movement of the brush. Never apply grease.*

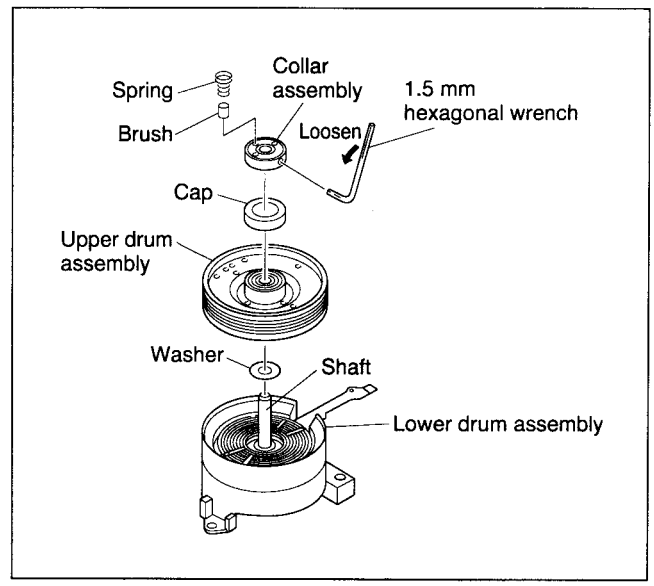


Fig. 2-2-44

2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-45.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-44.)

Note: *When replacing the upper drum assembly, replace it the together with the washer.*

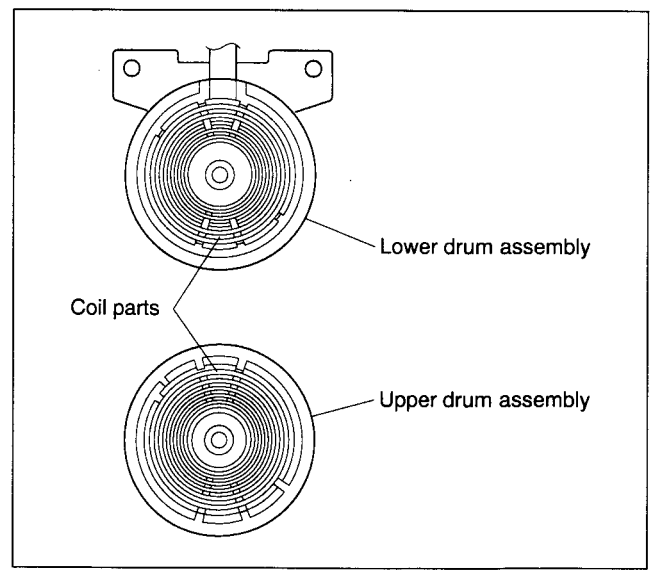


Fig. 2-2-45

(3) Install the cap to the upper drum assembly.
(4) Position the collar assembly as indicated in Fig.2-2-46 while controlling its up- down movement.

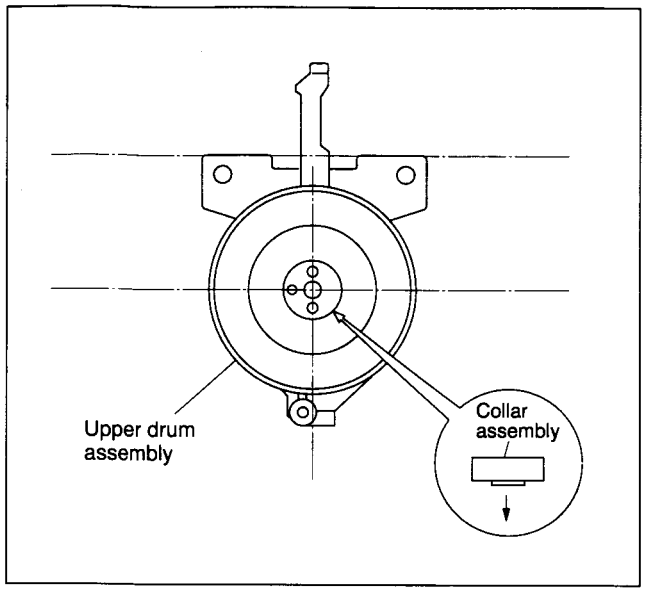


Fig. 2-2-46

(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

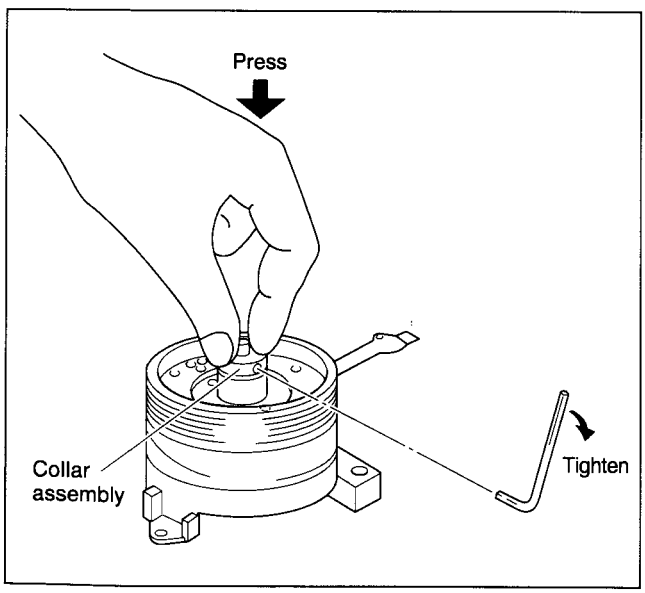


Fig. 2-2-47

(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.
(7) Install the rotor assembly and stator assembly according to Fig 2-2-41 and 2-2-42.
(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.
- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the LP mode.)

2.3 COMPATIBILITY ADJUSTMENT

Notes: • *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
• *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.3.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB. FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE, observe the FM waveform.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig.2-3-1.)
(5) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (See Fig.2-3-3.)
(6) Then play MHPE-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play the alignment tape MHPE-L again and confirm the FM waveform.

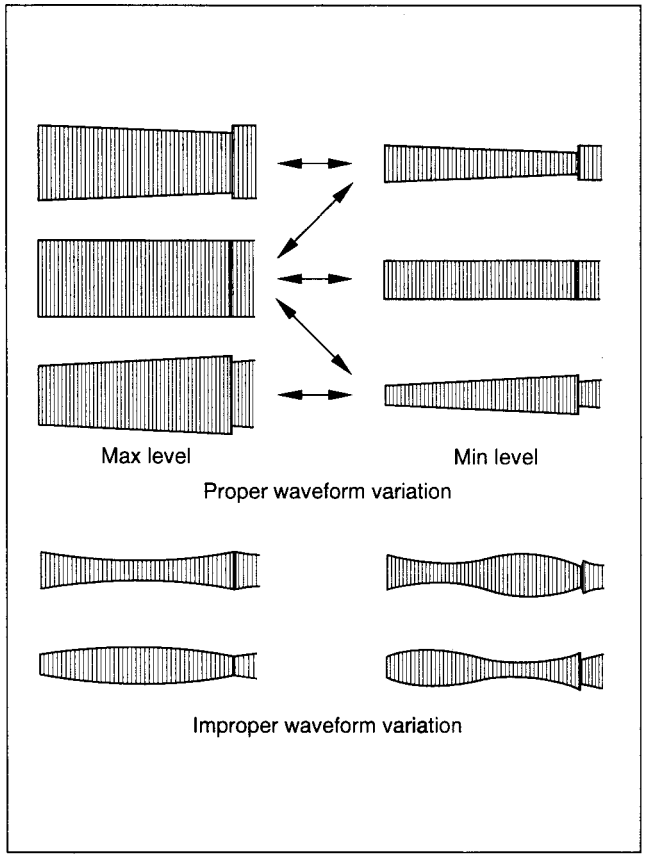


Fig. 2-3-1

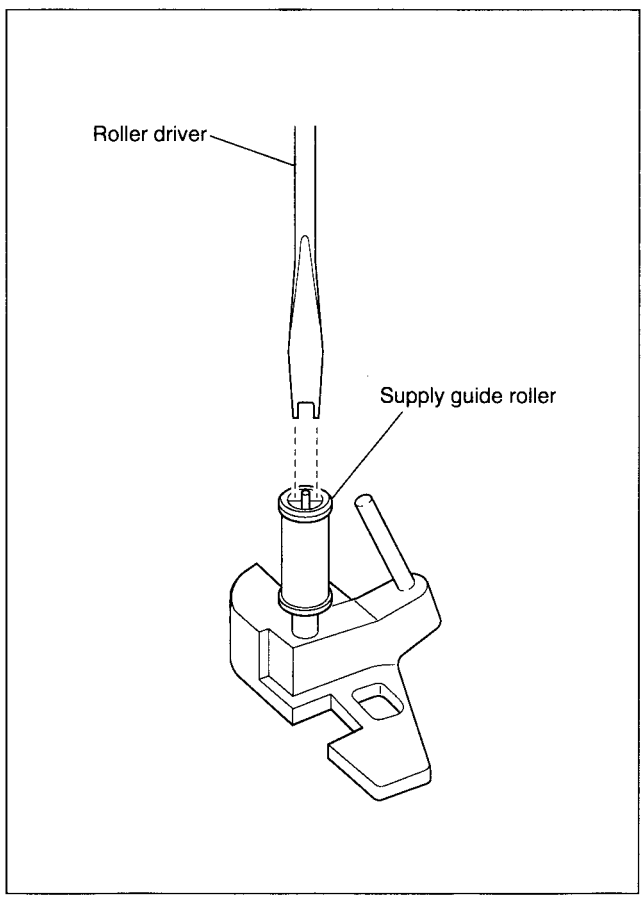


Fig. 2-3-2

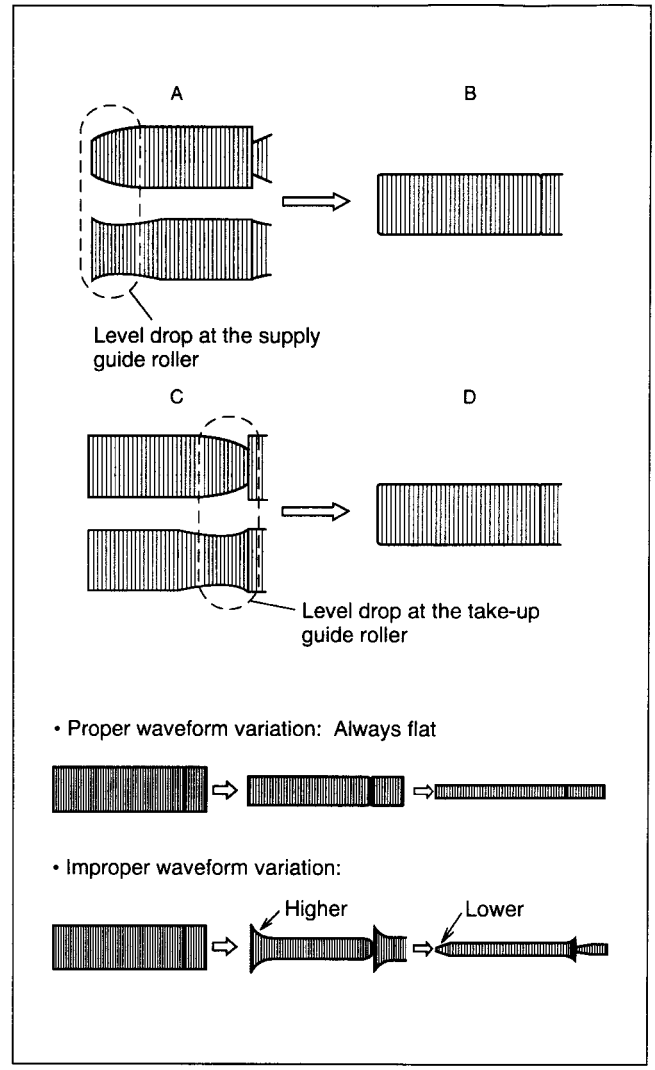


Fig. 2-3-3

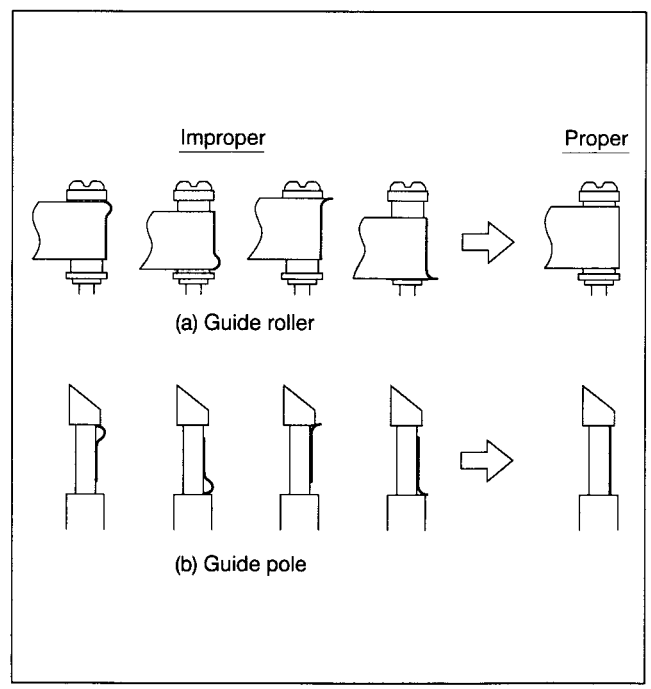


Fig. 2-3-4

2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: *Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-15.)*

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL.P) of the main board assembly and observe the waveforms on both channels in the ALT mode.
(2) Play the alignment tape MHPE and adjust it by turning the screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. The screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

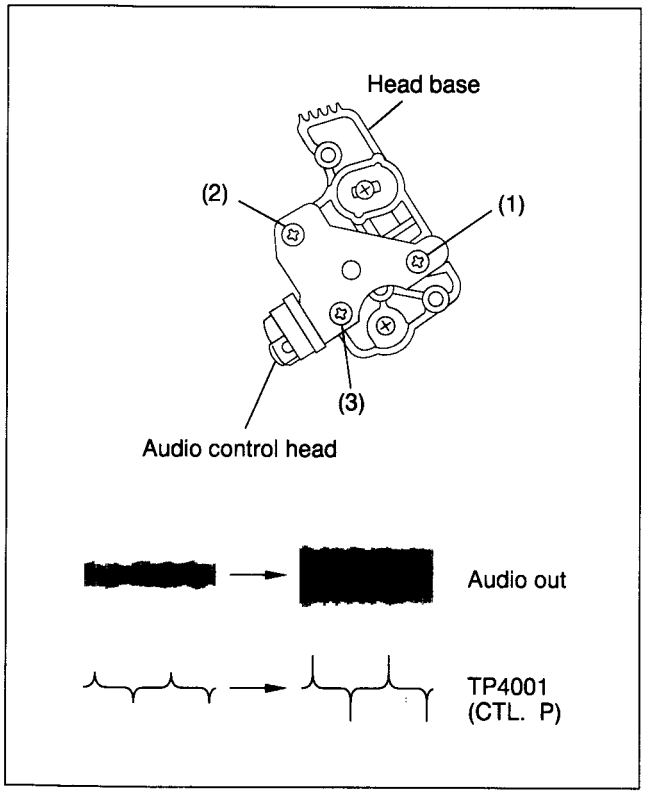


Fig. 2-3-5

2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB. FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Play the alignment tape MHPE and observe the FM waveforms.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-3-6.
(5) Turn the A/C head position bit fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the FM waveform output level. Then tighten the screw (4) temporarily.
(6) Then play the alignment tape MHPE-L.
(7) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings the tracking to the centre.)
(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
(9) If it is not at maximum, loosen the temporarily tightened the screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

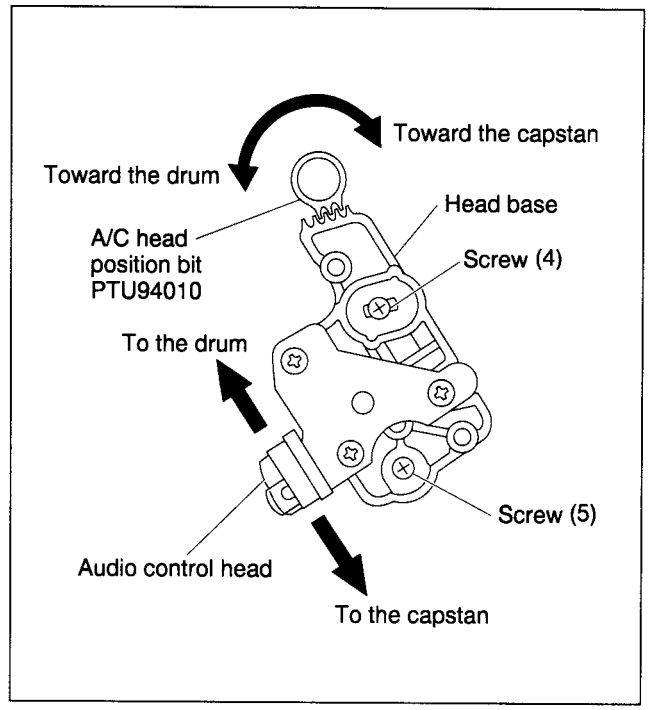


Fig. 2-3-6

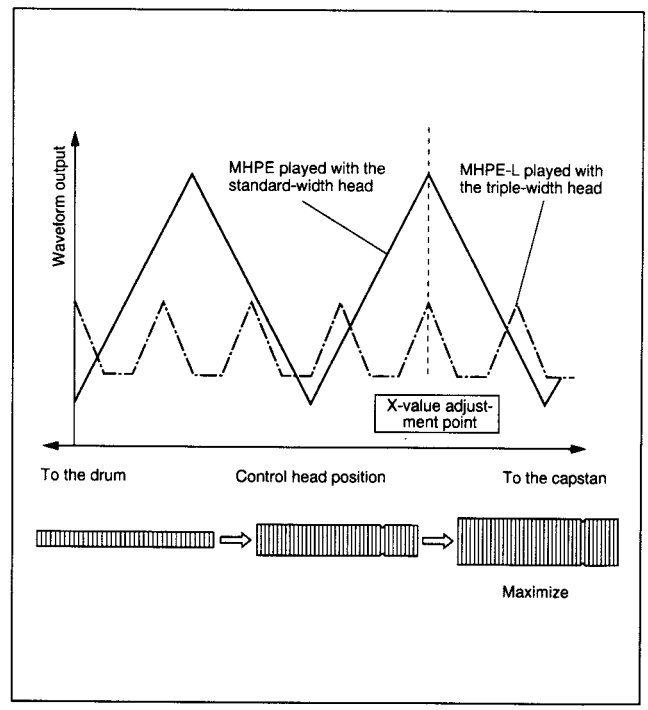


Fig. 2-3-7

2.3.4 Checking/Adjustment the Standard Tracking Preset

Note: *Set the remote control code of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control code of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB. FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHPE-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.3.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 25 - 51 gf•cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
  1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE.)
  2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-3-8.)

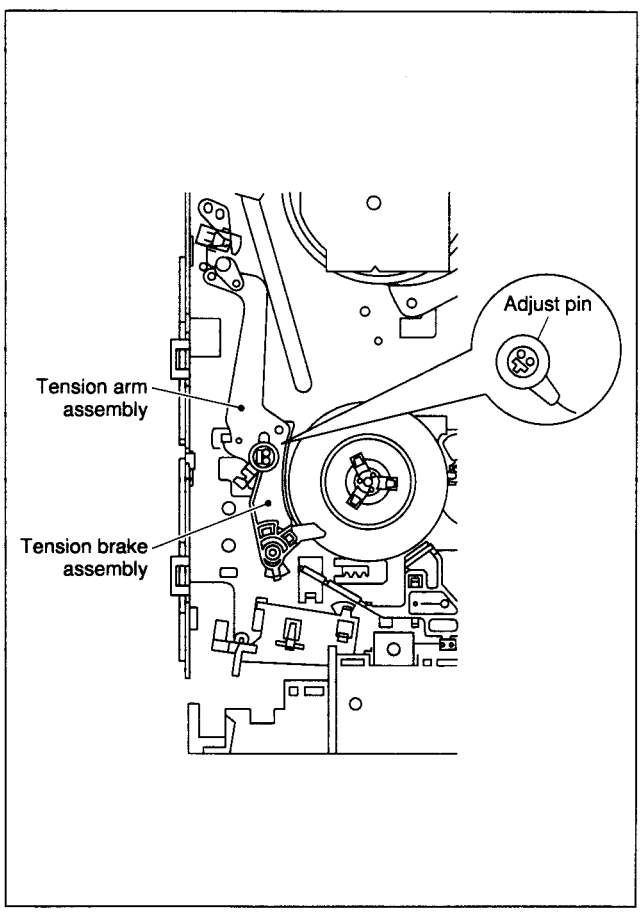


Fig. 2-3-8

2.3.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck. (See Fig. 2-3-9.)

Note: *Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.*

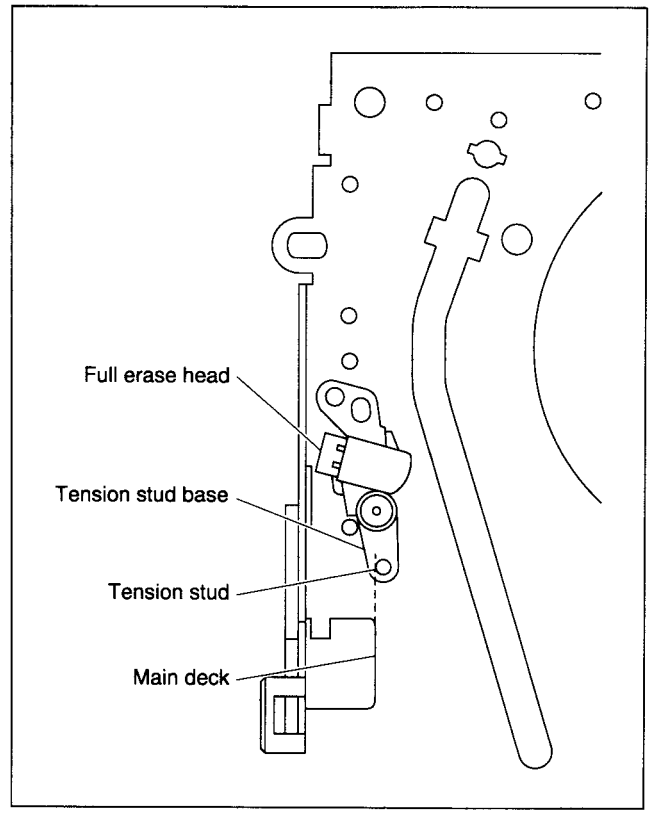


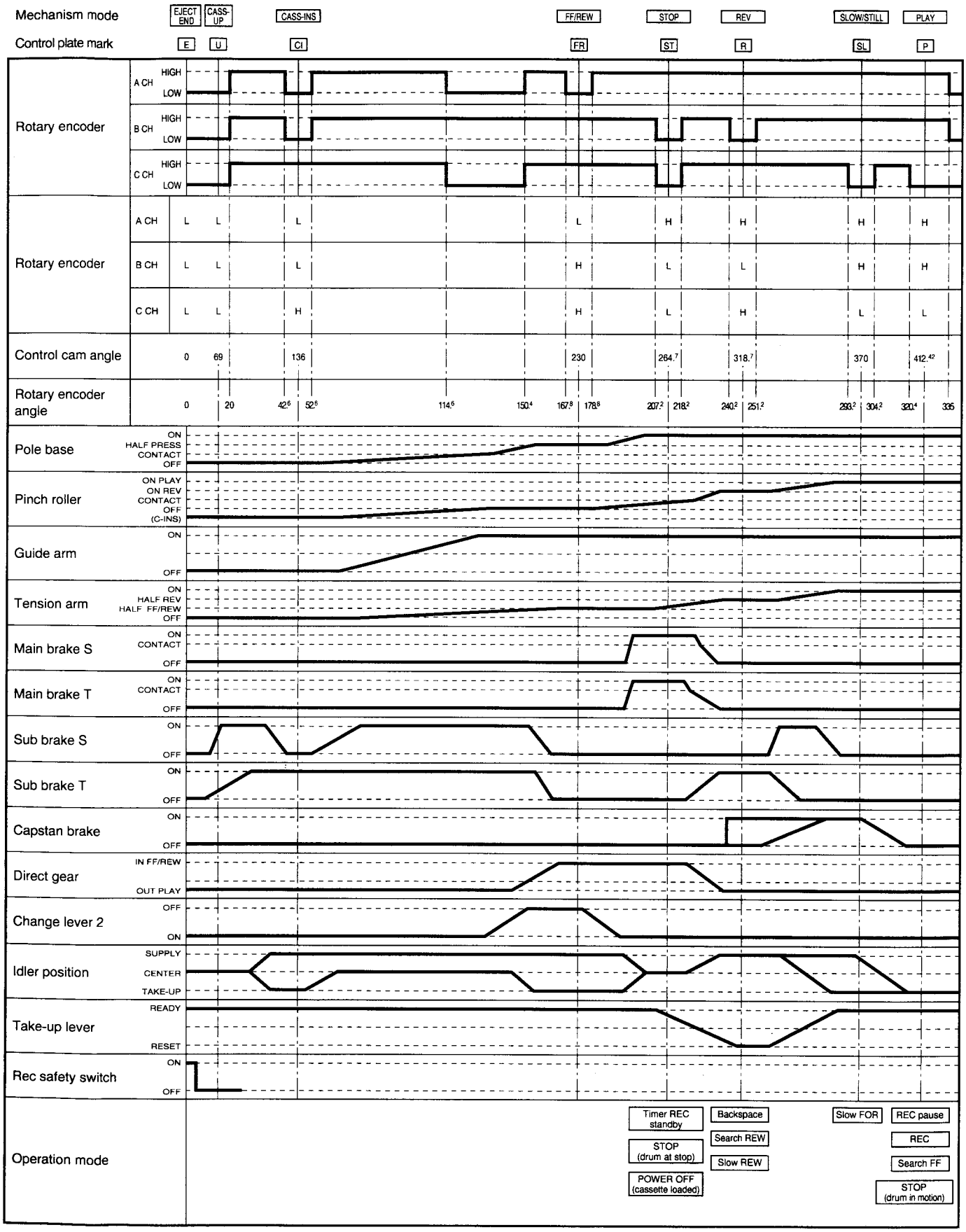
Fig. 2-3-9

2.3.7 Main Brake Torque Adjustment

Note: Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, removed or attached.

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel disk on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel disk starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $23.^{5}$ — $78.^{4}$ x 10^{-3} N•m (240 — 800 gf•cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake assembly.

Mechanism Timing Chart



SECTION 3
ELECTRICAL ADJUSTMENT

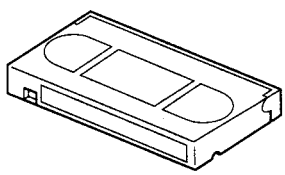
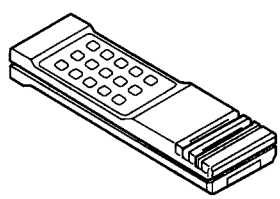
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Signal generator: PAL colour bar, stairstep
⑤ Recording tape
⑥ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU94008
	

3.1.3 Colour bar signal,colour bar pattern

● PAL colour bar signal

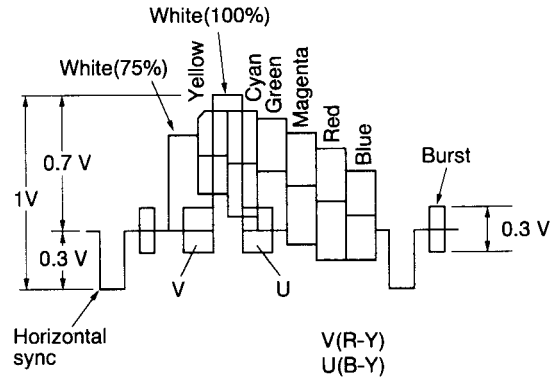


Fig.3-1-1 PAL colour bar signal waveform

● PAL colour bar pattern

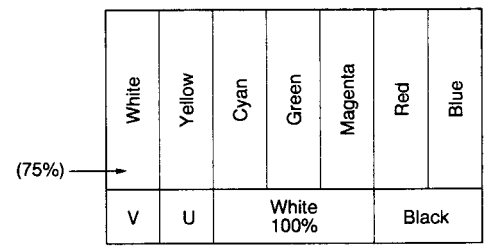


Fig.3-1-2 PAL colour bar pattern

Note:

The system control circuit of this model has an automatic recognition about the ON-OFF control of the ***DOCTOR SYSTEM.***

3.2 SERVO CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***
• ***Set the VCR to the mode A by the remote controller.***

3.2.1 PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB • Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• J7101-pin 19 (VIDEO OUT)
Trigger slope (-)	• TP111(D. FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

Note: • ***Use only the "O" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Connect an oscilloscope to J7101-pin 19 (VIDEO OUT) and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
(4) Playback the alignment tape again, confirm the switching point (See Fig.3-2-2).

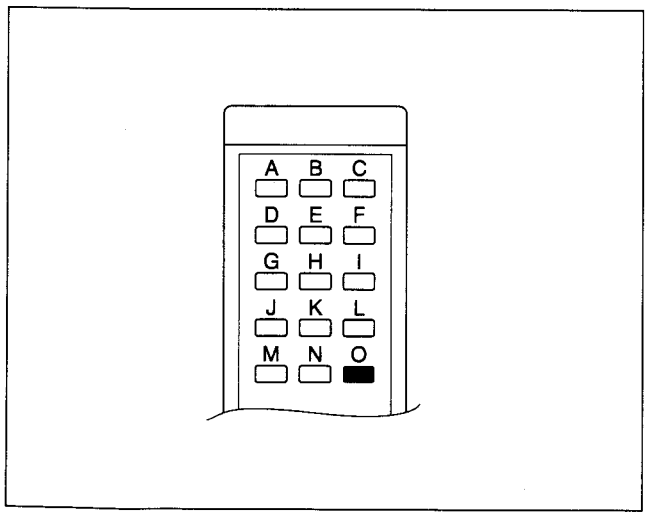


Fig.3-2-1 Presetting unit

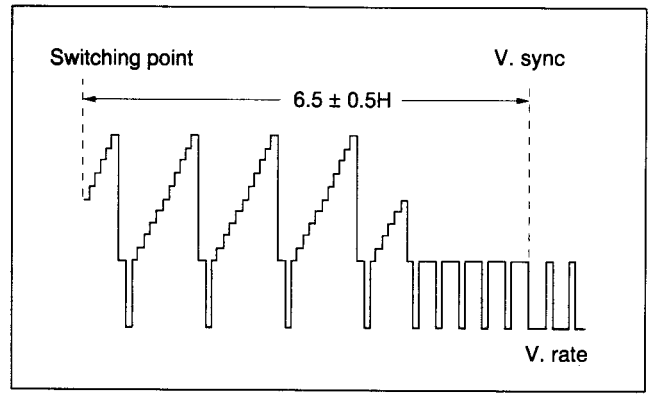


Fig.3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Tuner or colour bar
Mode	• SP/LP, REC → PB(SLOW) • Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note: • ***Use only the "B" and "C" buttons, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a colour bar signal in the SP mode.
(2) Playback the recorded signal on the FWD slow mode.
(3) Set the tracking control to the centre position by simultaneously pressing the CH "+" and "–" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing the "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in the REV slow mode.
(8) Repeat steps (1) to (7) in the LP mode.

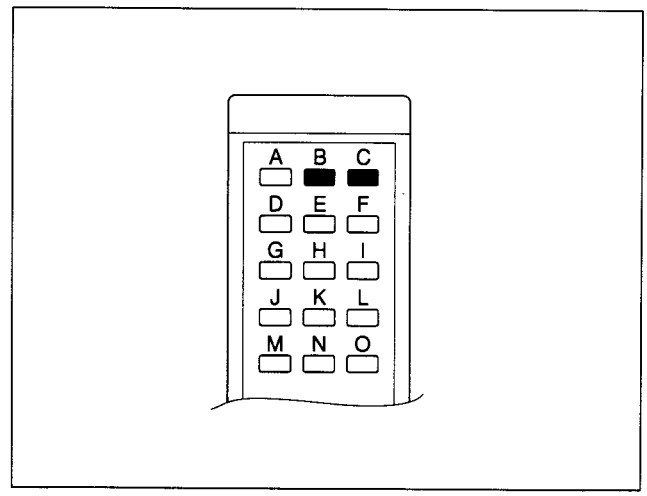


Fig.3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***

• ***Set the VCR to the mode A by the remote controller.***

3.3.1 Auto picture

Signal	• Monoscope
Mode	• B.E.S.T : OFF • REC then PB • SP/LP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

Note: • ***Use only the "L" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a monoscope signal in the SP mode.
(2) Playback the recorded signal.
(3) Press the "L" button of the presetting unit during playback.
(4) Confirm that the VCR will go into the STOP mode.
(5) Repeat steps (2) to (4) in the LP mode.

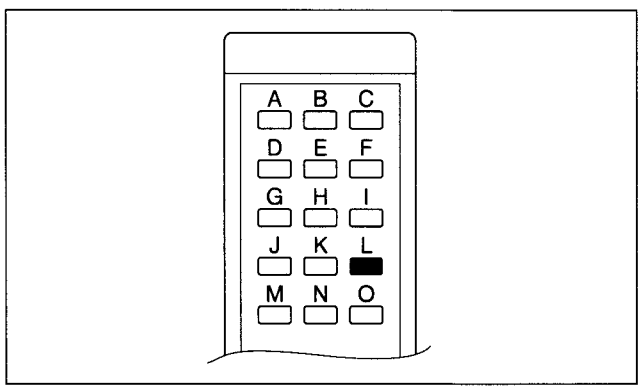


Fig.3-3-1 Presetting unit

3.4 SYSCON CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***

• ***When perform this adjustment,remove the MECHANISM assembly.***

3.4.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• IC3001-PIN61
Adjustment part	• C3025 (TIMER CLOCK)
Specification	• 1024.008 ± 0.001 Hz [976.5549 ± 0.0010 µsec.]

(1) Connect the frequency counter to IC3001-PIN61.
(2) Connect the short wire between IC3001-PIN24 and Vcc(5V).
(3) Short the leads of capacitor C3026 once in order to reset IC3001.
(4) Disconnect the short wire between IC3001-PIN24 and Vcc then connect it again.
(5) Adjust C3025 trimmer capacitor so that the output from IC3001-PIN61 falls within 1024.008 ± 0.001 Hz (976.5549 ± 0.0010 µsec.) range.

3.5 ON SCREEN CIRCUIT

Note: • ***Set the VCR to the mode A by the remote controller.***

3.5.1 Character position

Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit [PTU94008] • Digit-key remote controller
Specification	• Character centre

Note: • ***Use only the "H" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Press the MENU button and display the on screen character.
(2) Observe the TV-monitor and centre position of character by pressing the "H" button of the presetting unit.

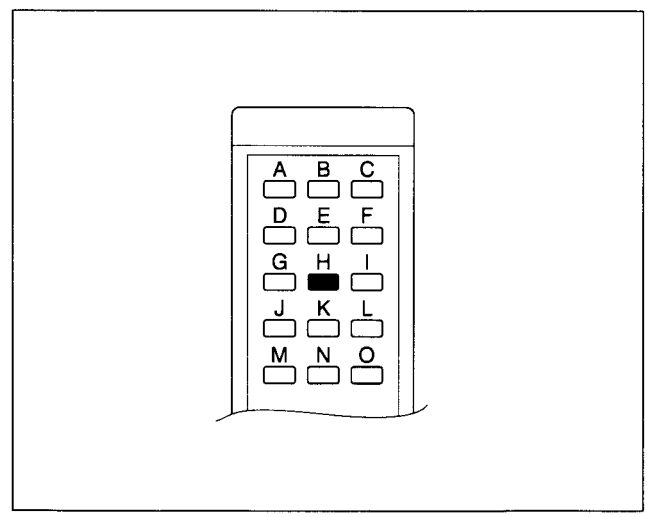


Fig.3-5-1 Presetting unit

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

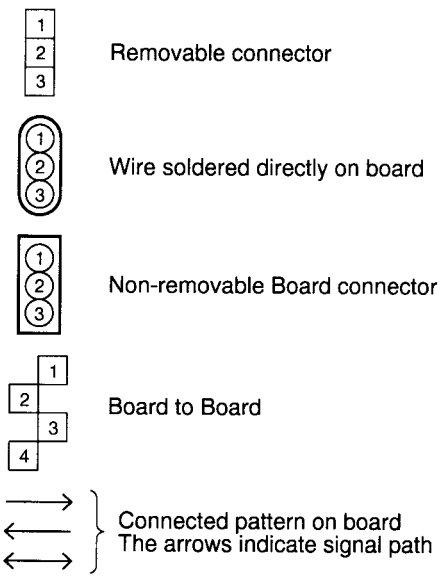
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

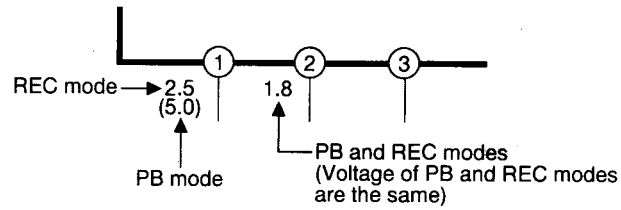
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications



4. Voltage measurement

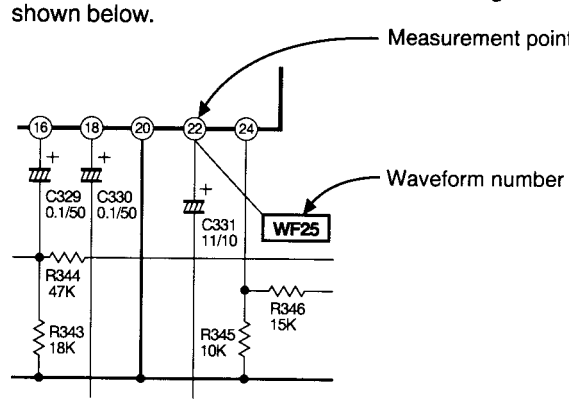
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



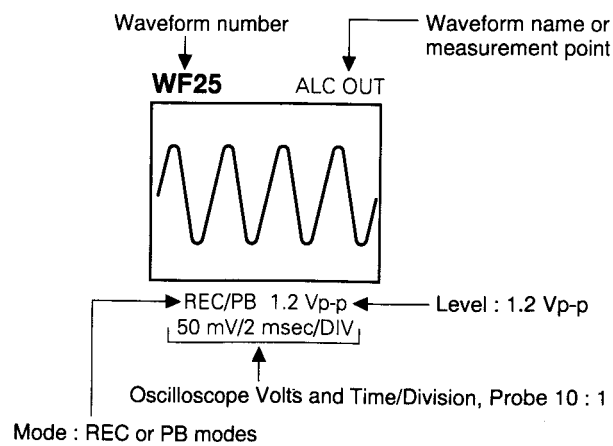
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.

Playback signal path

Playback and recording signal path

Recording signal path
(including E-E signal path)

Capstan servo path

Drum servo path

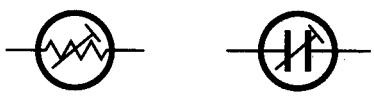
(Example)

R-Y Playback R-Y signal path

Y Recording Y signal path

7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

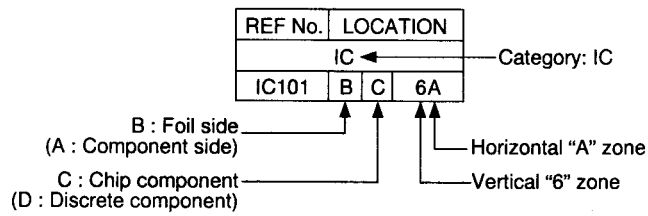
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

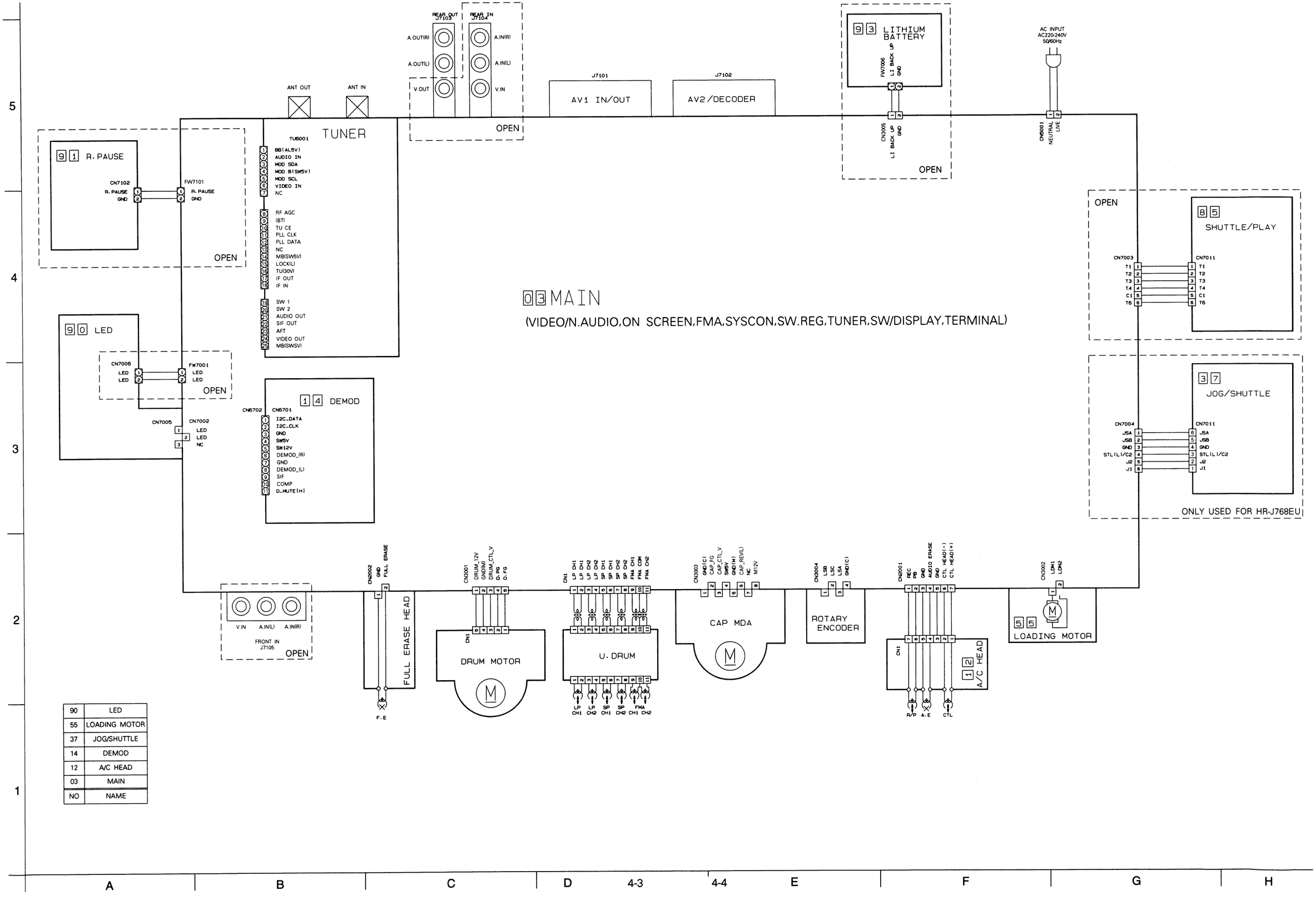
Parts location are indicated by guide scale on the circuit board.



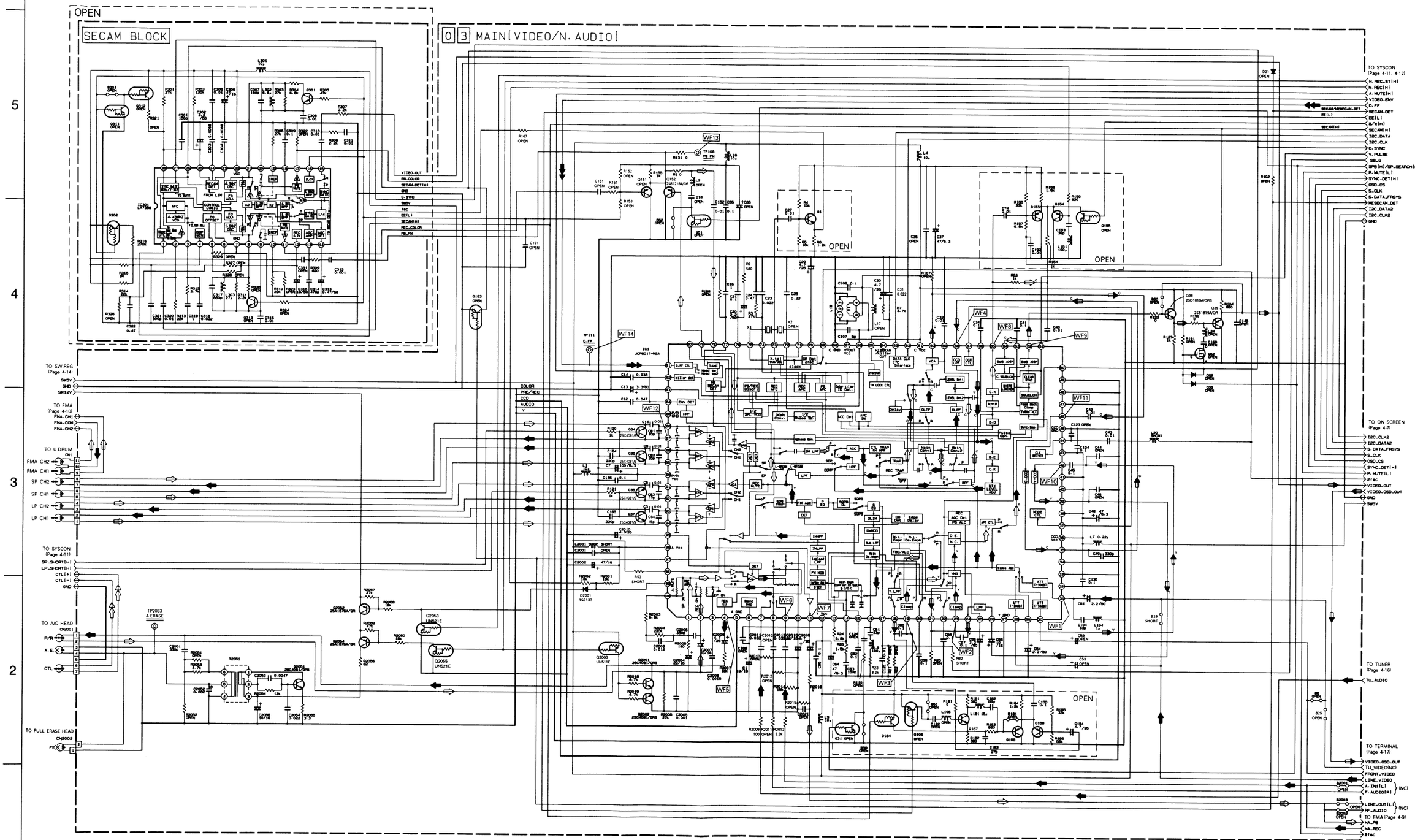
Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS

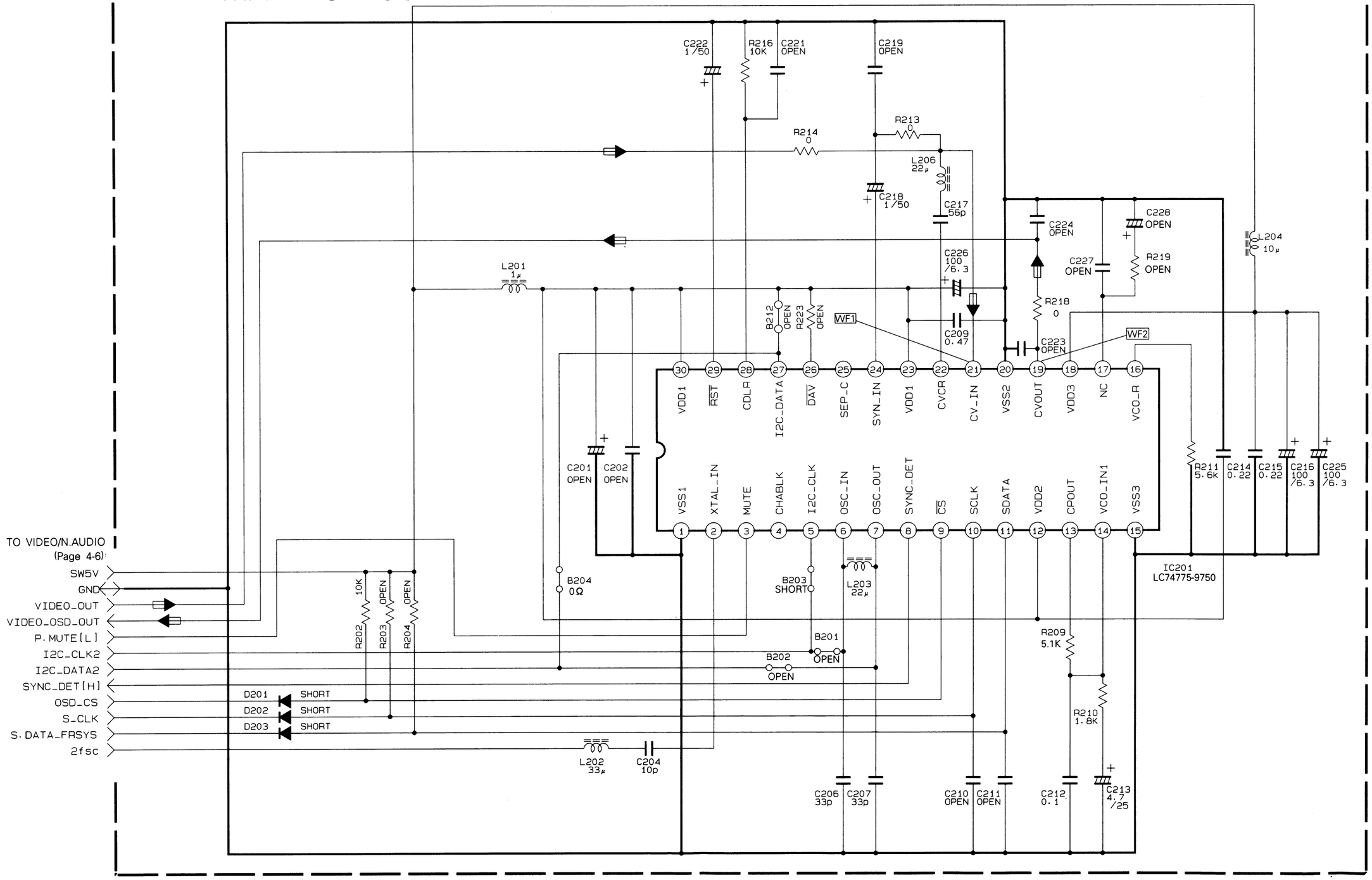


4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM



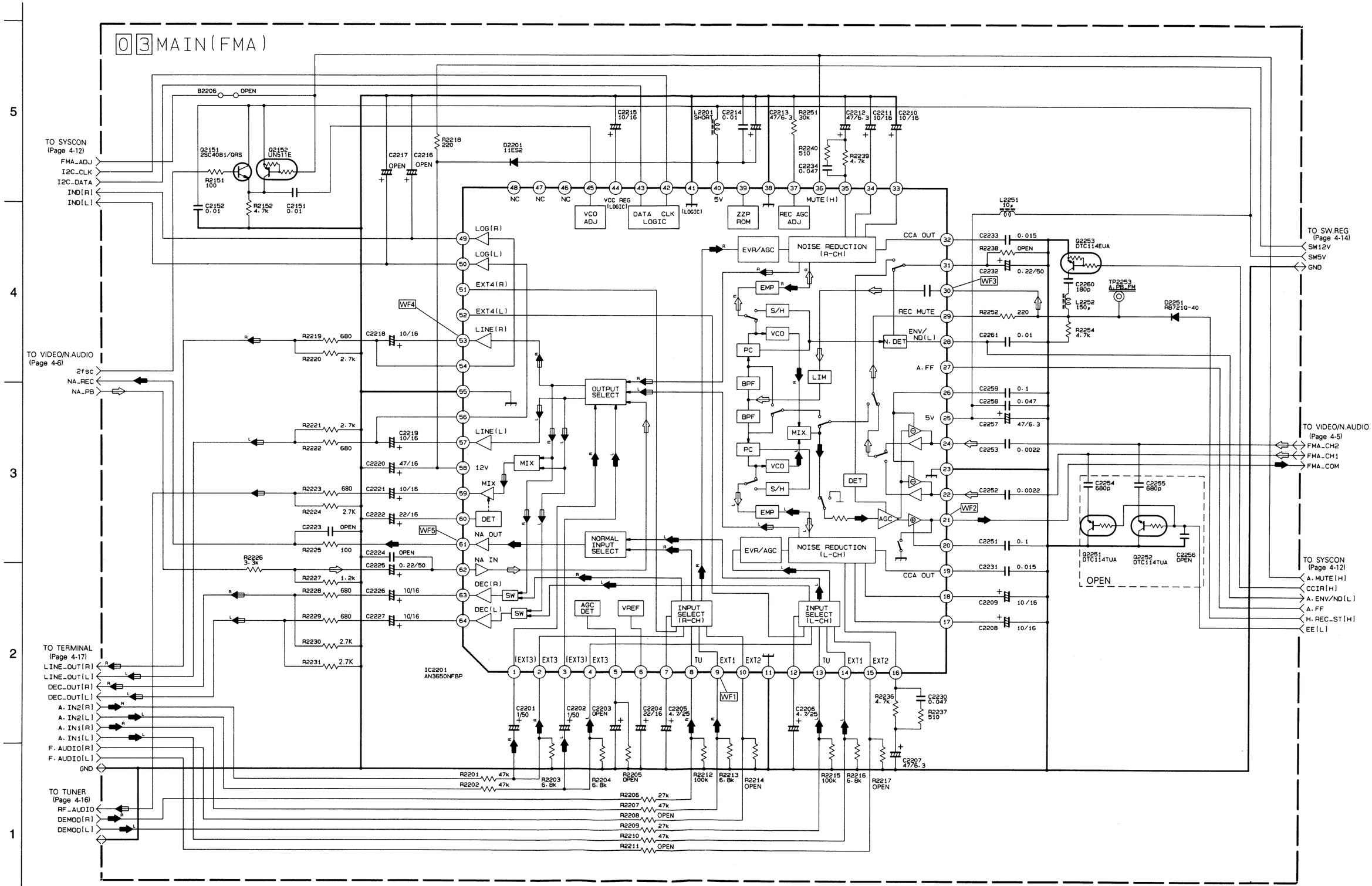
NOTE : For VIDEO/N.AUDIO waveforms, please refer to page 4-21.

03 MAIN (ON SCREEN)



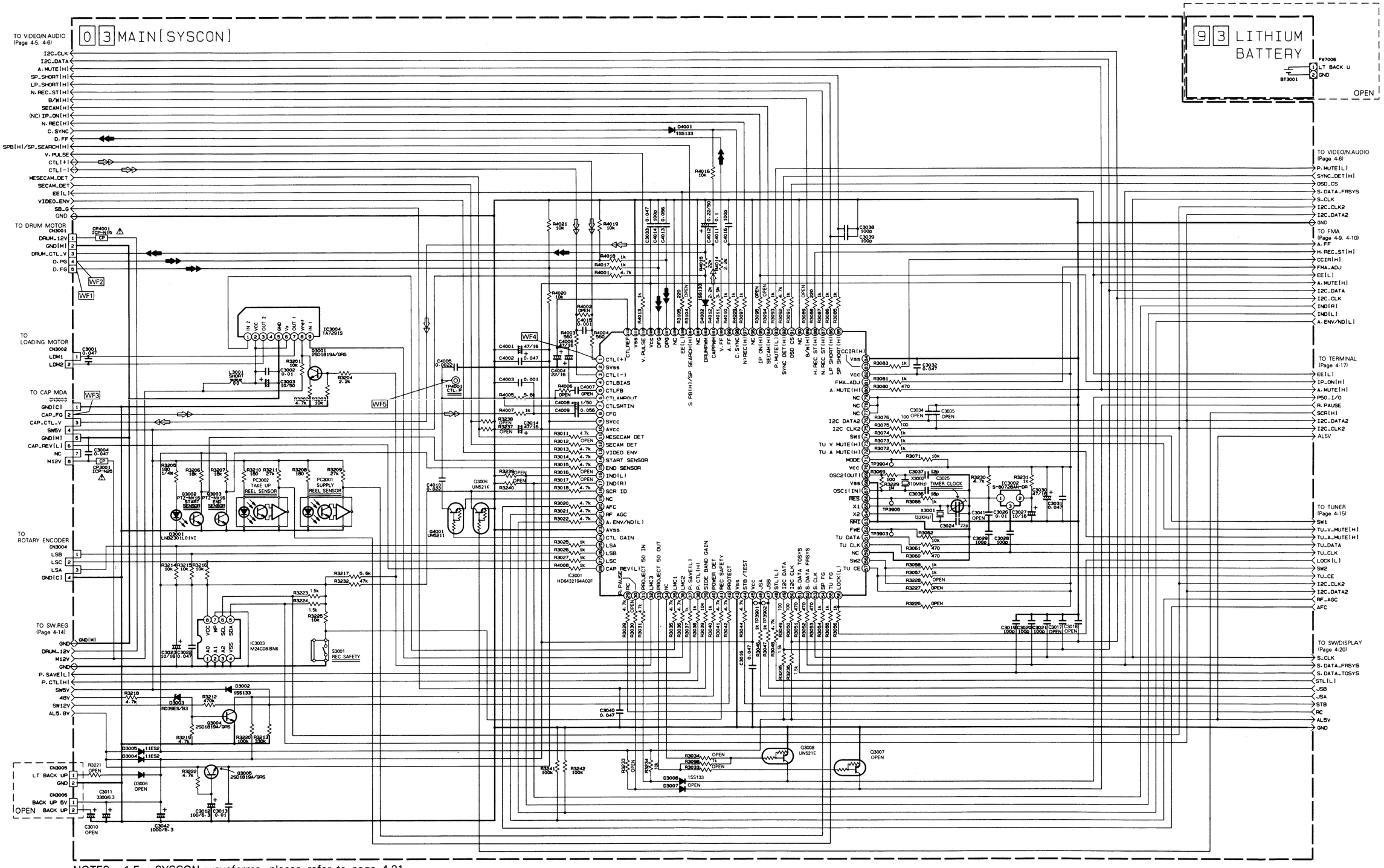
NOTE: For ON SCREEN waveforms, please refer to page 4-21.

4.4 FMA SCHEMATIC DIAGRAM



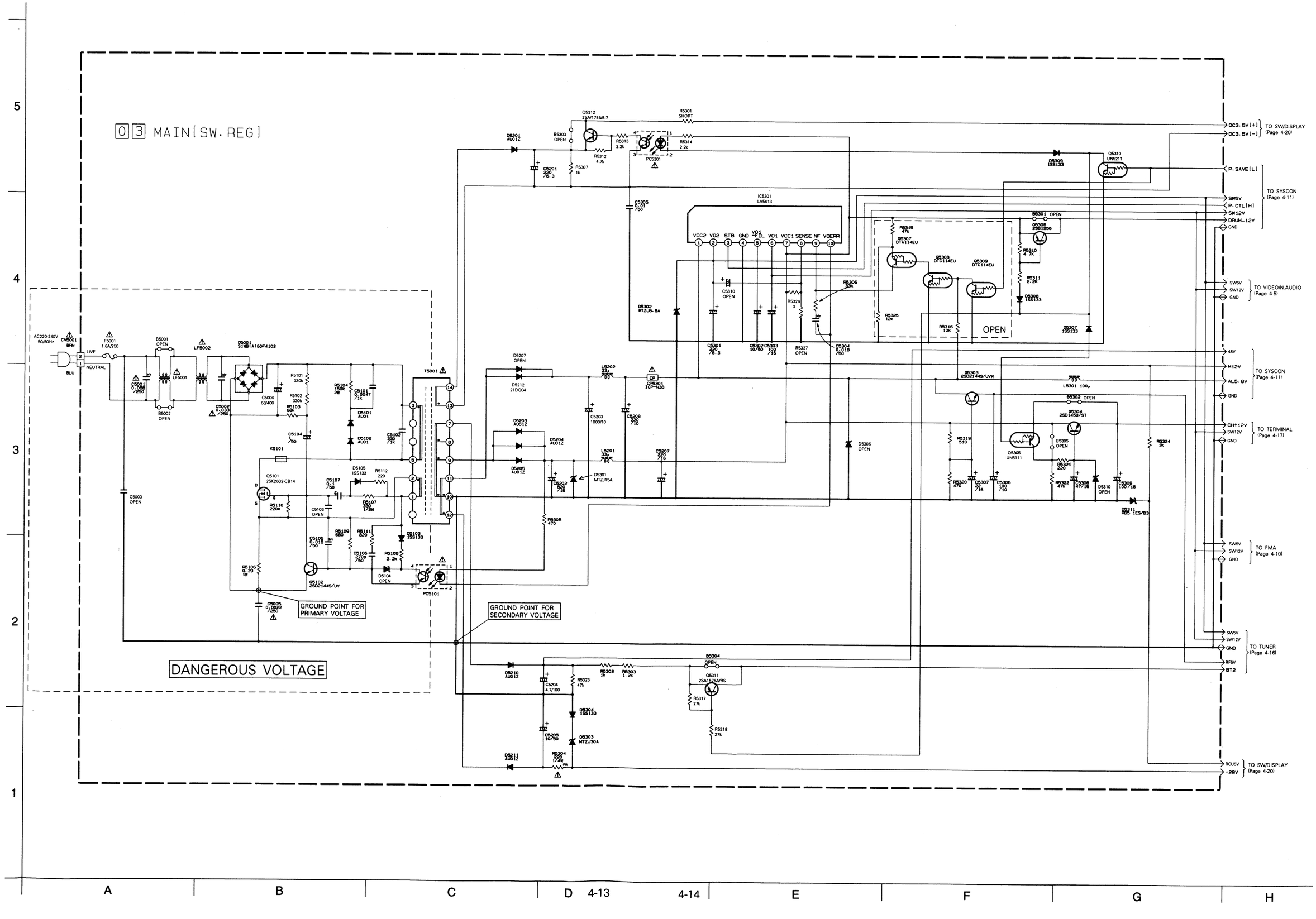
NOTE: For FMA waveforms, please refer to page 4-21.

4.5 SYSTEM CONTROL SCHEMATIC DIAGRAM

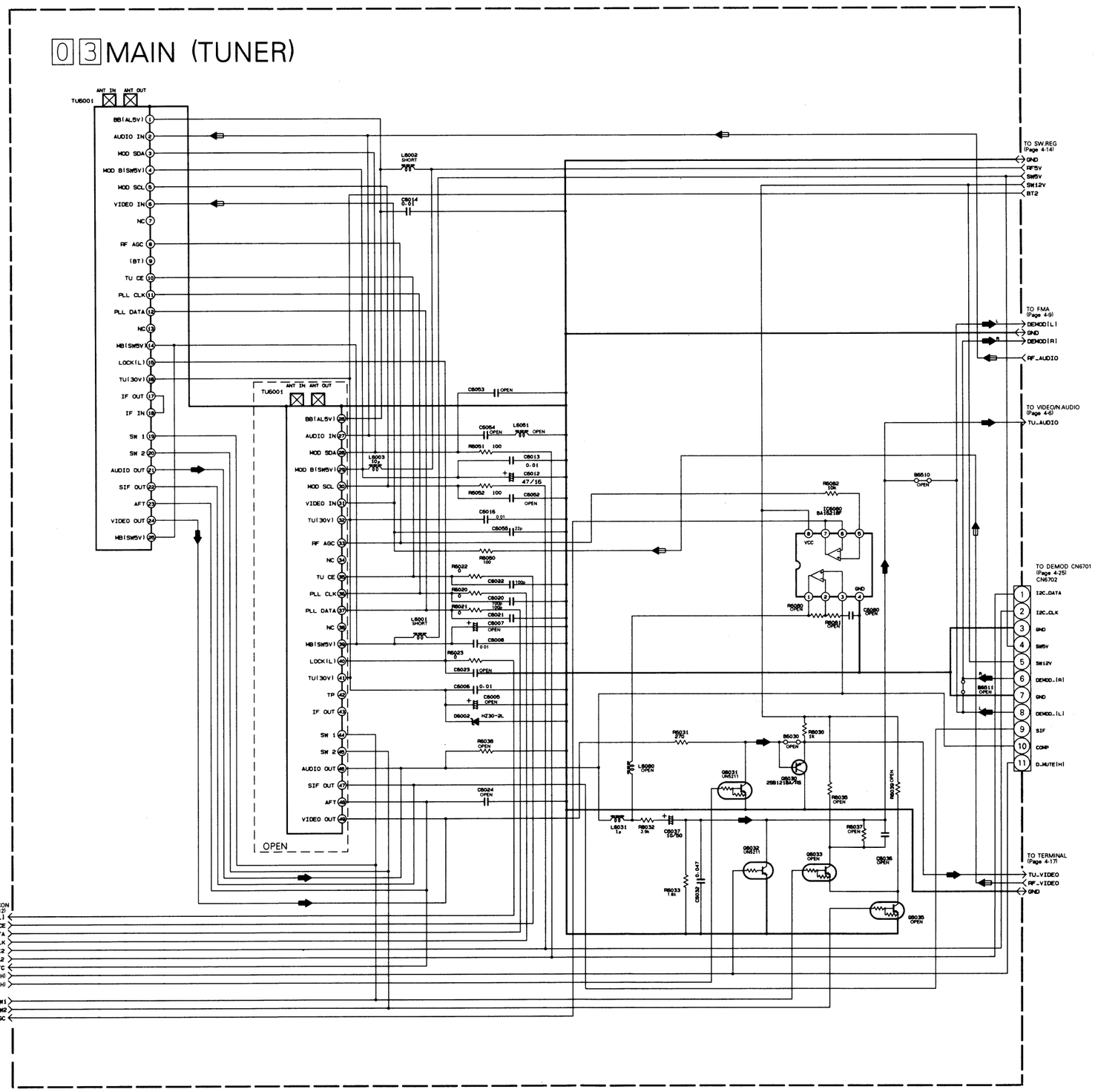


NOTES : 1.For SYSCON waveforms, please refer to page 4-21.
2.The SYSTEM CONTROL circuit of this model has an automatic recognition about the ON-OFF control of the DOCTOR SYSTEM.

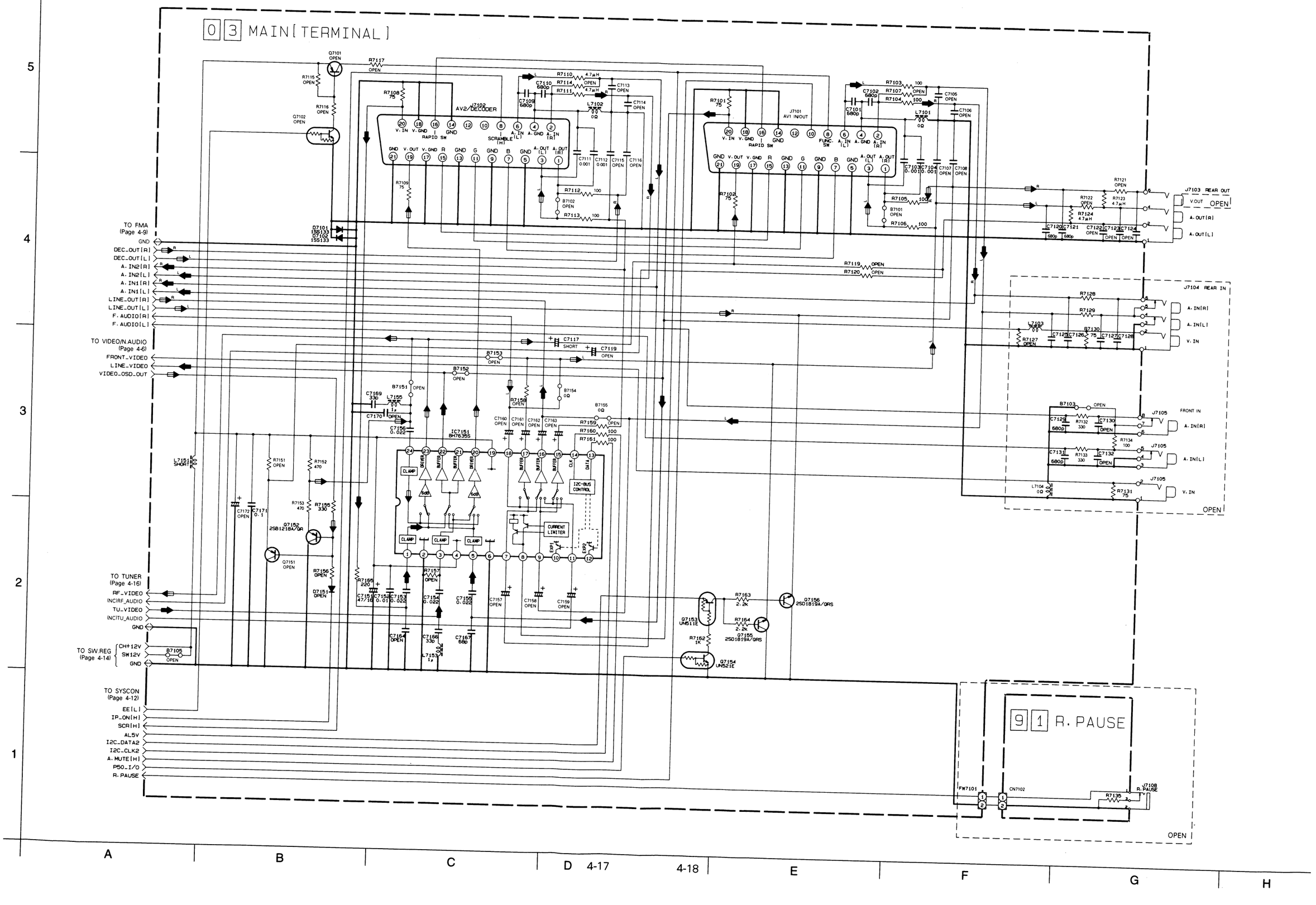
4.6 SWITCHING REGULATOR SCHEMATIC DIAGRAM



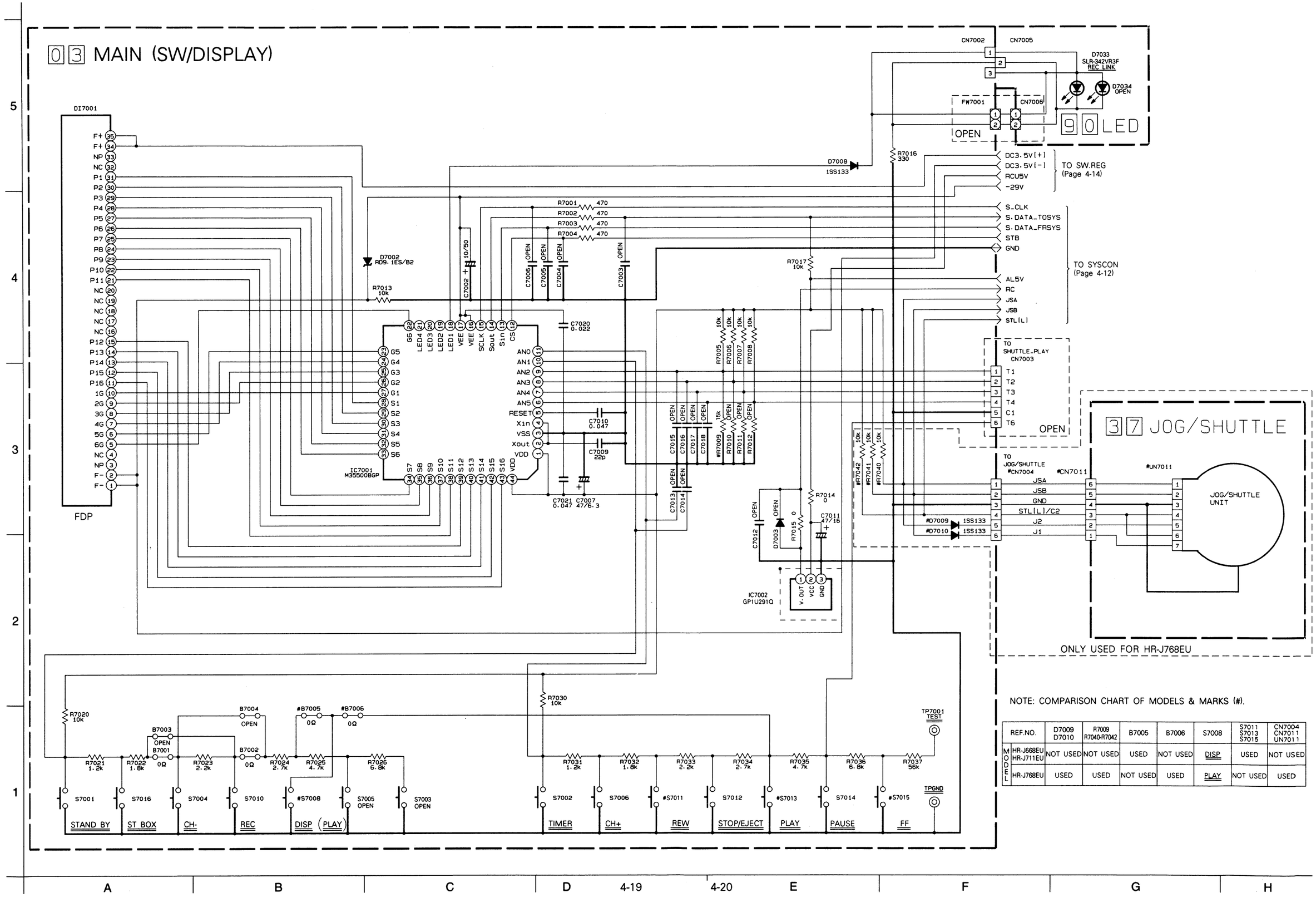
4.7 TUNER SCHEMATIC DIAGRAM



4.8 TERMINAL SCHEMATIC DIAGRAM



4.9 SW/DISPLAY, LED AND JOG/SHUTTLE SCHEMATIC DIAGRAMS



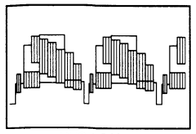
NOTE: COMPARISON CHART OF MODELS & MARKS (#).

	REF.NO.	D7009 D7010	R7009 R7040-R7042	B7005	B7006	S7008	S7011 S7013 S7015	CN7004 CN7011 UN7011
MODEL	HR-J668EU HR-J711EU	NOT USED	NOT USED	USED	NOT USED	DISP	USED	NOT USED
	HR-J768EU	USED	USED	NOT USED	USED	PLAY	NOT USED	USED

WAVEFORMS

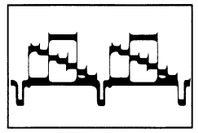
— VIDEO/N.AUDIO —

WF1 IC1-31



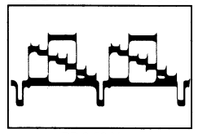
REC 1.0 Vp-p
50 mV/20 µsec/DIV

WF2-1 IC1-23



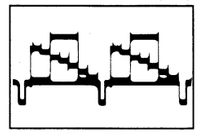
REC 0.47 Vp-p
20 mV/20 µsec/DIV

WF2-2 IC1-23



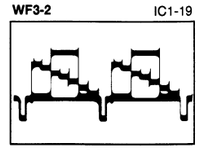
PB 0.53 Vp-p
20 mV/20 µsec/DIV

WF3-1 IC1-19



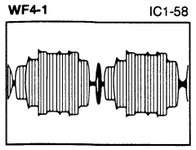
REC 0.5 Vp-p
20 mV/20 µsec/DIV

WF3-2 IC1-19



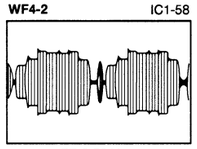
PB 0.55 Vp-p
20 mV/20 µsec/DIV

WF4-1 IC1-58



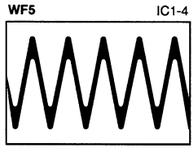
REC 0.6 Vp-p
20 mV/20 µsec/DIV

WF4-2 IC1-58



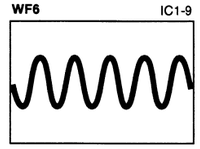
PB 0.56 Vp-p
20 mV/20 µsec/DIV

WF5 IC1-4



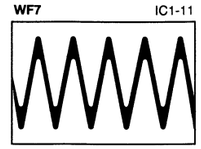
REC 0.65 Vp-p
20 mV/0.5 msec/DIV

WF6 IC1-9



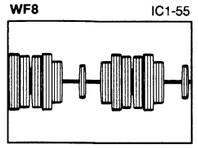
REC 0.09 Vp-p
5 mV/0.5 msec/DIV

WF7 IC1-11



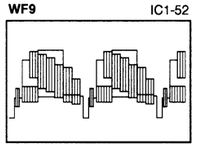
PB 0.6 Vp-p
10 mV/0.5 msec/DIV

WF8 IC1-55



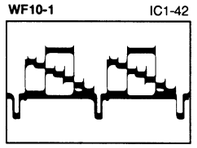
PB 0.55 Vp-p
20 mV/20 µsec/DIV

WF9 IC1-52



REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF10-1 IC1-42

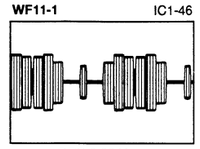


REC 0.4 Vp-p
10 mV/20 µsec/DIV

WF10-2 IC1-42

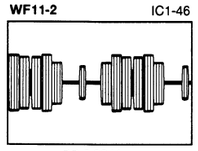
PB 0.45 Vp-p
10 mV/20 µsec/DIV

WF11-1 IC1-46



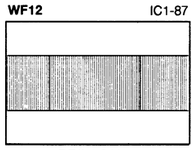
REC 0.38 Vp-p
10 mV/20 µsec/DIV

WF11-2 IC1-46



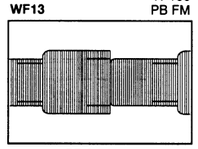
PB 0.32 Vp-p
10 mV/20 µsec/DIV

WF12 IC1-87



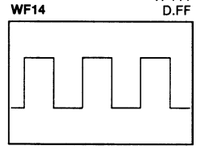
REC 1.3 Vp-p
0.1 V/1 msec/DIV

WF13 TP106 PB FM



PB 0.5 Vp-p
20 mV/1 msec/DIV

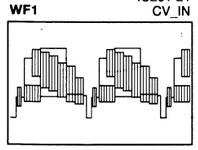
WF14 TP111 D.FF



REC/PB 5.1 Vp-p
0.2 V/10 msec/DIV

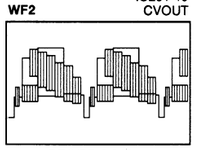
— ON SCREEN —

WF1 IC201-21 CV_IN



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

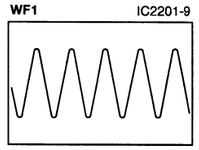
WF2 IC201-19 CVOUT



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

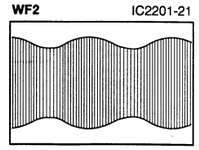
— FMA —

WF1 IC2201-9



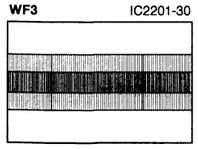
REC 0.1 Vp-p
2 mV/0.5 msec/DIV

WF2 IC2201-21



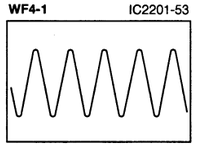
REC 0.6 Vp-p
10 mV/0.5 msec/DIV

WF3 IC2201-30



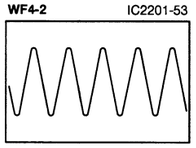
PB 2.6 Vp-p
50 mV/0.1 msec/DIV

WF4-1 IC2201-53



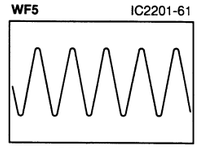
REC 1.05 Vp-p
20 mV/0.5 msec/DIV

WF4-2 IC2201-53



PB 0.75 Vp-p
20 mV/0.5 msec/DIV

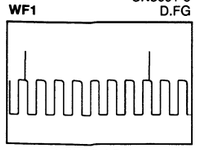
WF5 IC2201-61



REC 0.11 Vp-p
2 mV/0.5 msec/DIV

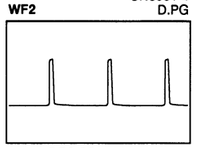
— SYSCON —

WF1 CN3001-5 D.FG



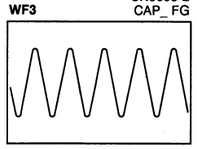
REC/PB 4.5 Vp-p
0.2 V/5 msec/DIV

WF2 CN3001-4 D.PG



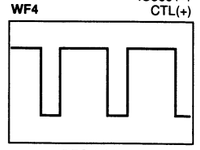
REC/PB 4.6 Vp-p
0.2 V/10 msec/DIV

WF3 CN3003-2 CAP_FG



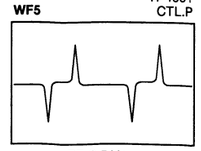
REC/PB 2.5 Vp-p
50 mV/0.5 msec/DIV

WF4 IC3001-1 CTL(+)



REC 4.0 Vp-p
0.1 V/10 msec/DIV

WF5 TP4001 CTL.P



PB 2.5 Vp-p
50 mV/10 msec/DIV

COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION
CAPACITOR	
C1	A D 11N
C3	B C 13O
C5	B C 13N
C7	A D 12O
C9	B C 13N
C11	B C 13N
C12	A D 13M
C13	A D 13M
C14	B C 13M
C16	B C 13L
C18	B C 14L
C20	A D 13K
C21	B C 13K
C23	B C 13K
C24	B C 14K
C25	B C 14K
C27	B C 13L
C29	A D 13J
C30	A D 13K
C31	B C 12L
C32	B C 12K
C34	A D 11K
C36	B C 12L
C37	A D 12K
C40	B C 12K
C41	B C 11L
C42	A D 10J
C43	B C 11K
C44	A D 11K
C45	B C 11L
C46	B C 10K
C48	A D 11L
C49	B C 10L
C51	A D 10L
C52	A D 10L
C53	A D 10L
C54	A D 10M
C55	A D 10M
C56	A D 10M
C57	B C 10M
C58	B C 10L
C59	B C 9M
C60	B C 9M
C61	B C 10N
C62	B C 10N
C63	B C 10N
C64	A D 10N
C65	B C 11N
C74	B C 12K
C81	B C 13N
C82	B C 13N
C83	B C 13N
C84	B C 14L
C85	B C 14L
C86	A D 14L
C104	B C 10L
C107	B C 12L
C108	B C 12L
C121	B C 9M
C122	B C 9L
C123	B C 11K
C124	B C 10N
C134	B C 11L
C135	B C 11L
C136	B C 12N
C145	B C 11K
C151	B C 6I
C152	B C 13M
C153	B C 12J
C154	B C 9L
C155	B C 9K
C164	B C 13N
C165	B C 14N
C168	B C 11N
C169	B C 11K
C182	B C 9L
C183	B C 9L
C191	B C 9I
C192	B C 12J
C193	B C 9K
C201	B C 20F
C202	B C 19G
C204	B C 19F
C206	B C 19G
C207	B C 19G
C209	B C 19G
C210	B C 18G
C211	B C 18G
C212	B C 18G
C213	B C 17G
C214	B C 18G
C215	B C 18G
C216	B C 18G
C217	B C 19G
C218	B C 19G
C219	B C 19H
C221	B C 19G
C222	B C 19H
C223	B C 18H
C224	B C 18H
C225	B C 17H
C226	B C 18H
C227	B C 18G
C228	B C 17G
C301	B C 8J
C302	B C 7K
C303	B C 7J
C304	B C 7J
C305	B C 7J
C306	B C 6K
C307	B C 7K
C308	B C 7J
C309	B C 7J
C310	B C 7K
C311	B C 7K
C312	B C 6J
C313	B C 6J
C314	B C 6J
C315	B C 7J
C316	B C 7J
C317	B C 7I
C318	B C 8J
C319	B C 8J
C320	B C 8J
C321	B C 7J
C322	B C 7J
C331	B C 6J
C2001	B C 12N
C2002	B C 12O
C2003	B C 12N
C2004	B C 11O
C2005	B C 11O
C2006	B C 12N
C2007	B C 12O
C2008	B C 12O
C2009	A D 11O
C2010	A D 12N
C2011	B C 11N
C2012	B C 11N
C2013	B C 11N
C2015	A D 10N
C2016	A D 10O
C2021	B C 10O
C2051	B C 9O
C2052	B C 9N
C2053	B C 8M
C2054	B C 9M
C2055	A D 8N
C2151	B C 15J
C2152	B C 15K
C2201	B C 17M
C2202	A D 17M
C2203	A D 17N
C2204	A D 16N
C2205	A D 16O
C2206	A D 15O
C2207	A D 15O
C2208	A D 16O
C2209	A D 16O
C2210	A D 15K
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C2213	A D 15K
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C2252	B C 15N
C2253	B C 15N
C2254	B C 15N
C2255	B C 15N
C2256	B C 14N
C2257	B C 15N
C2258	B C 15N
C2259	B C 14N
C2260	B C 14M
C2261	B C 14N
C3001	B C 7N
C3002	B C 6M
C3003	B C 6M
C3004	B C 6L
C3010	A D 21H
C3011	A D 22M
C3012	A D 21M
C3013	A D 22M
C3014	A D 21N
C3016	B C 22O
C3017	B C 21P
C3018	B C 22O
C3019	B C 22N
C3020	A D 22N
C3021	A D 21M
C3022	A D 22M
C3023	A D 21N
C3024	B C 22O
C3025	B C 21P
C3026	B C 22O
C3027	B C 22N
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C3033	B C 21I
C3034	B C 22O
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C3036	B C 22O
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C3038	B C 21O
C3039	B C 22O
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C3042	B C 20K
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C4007	A D 20K
C4008	A D 21I
C4009	A D 21O
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C4011	A D 21J
C4012	A D 21K
C4013	A D 21L
C4014	A D 21M
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C4016	A D 21O
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C5201	A D 22D
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C5207	A D 21B
C5208	A D 21C
C5301	A D 2E
C5302	A D 2E
C5303	A D 3E
C5304	A D 4D
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C5306	A D 4D
C5307	A D 4D
C5308	A D 3G
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C6005	A D 21H
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C6008	B C 22M
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C6014	B C 21P
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C6023	B C 22M
C6024	B C 21N
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C6037	B C 21J
C6052	B C 22O
C6053	B C 22P
C6054	B C 21O
C6055	B C 22O
C6080	B C 21J
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C7003	A D 10B
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C7005	A D 10B
C7006	A D 11B
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C7009	B C 13B
C7010	B C 13B
C7011	B C 13B
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C7155	B C 19J
C7156	B C 20L
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C7158	A D 19J
C7159	A D 19J
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C7161	A D 19L
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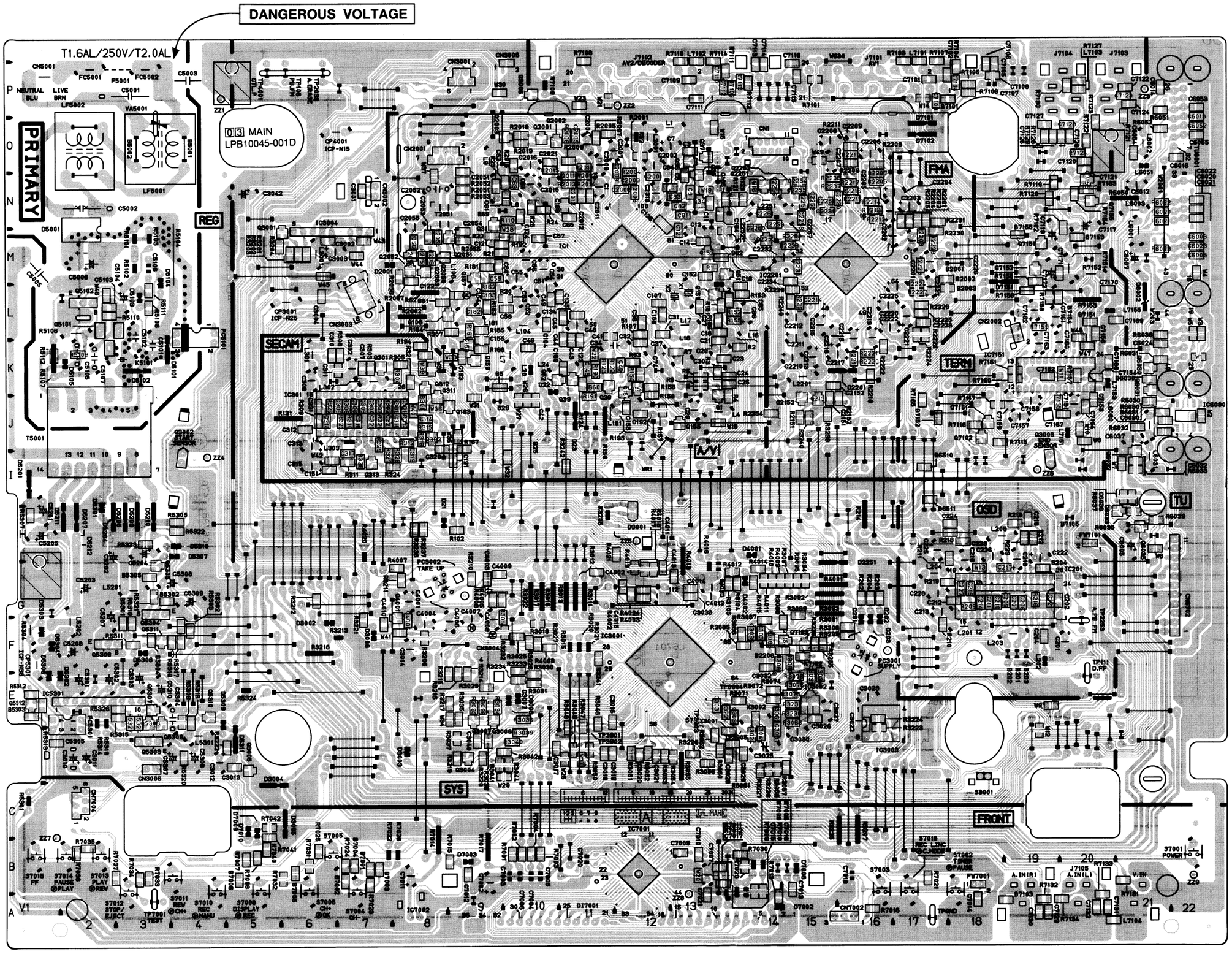
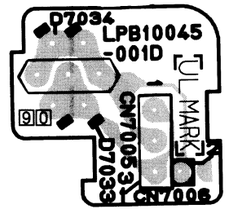
C7163	A D 19K
C7164	A D 20J
C7166	B C 20K
C7168	B C 20J
C7169	B C 21L
C7170	B C 20L
C7171	B C 20M
C7172	A D 19L
CONNECTOR	
CN1	A D 14O
CN2001	A D 9O
CN2002	A D 19L
CN3001	A D 9P
CN3002	A D 7N
CN3003	A D 7L
CN3004	A D 9F
CN3005	A D 10P
CN3006	A D 3D
CN5001	A D 1P
CN6702	A D 22F
CN7002	A D 16A
CN7004	A D 2C
DIODE	
D21	A D 8H
D22	A D 11K
D23	A D 11J
D201	A D 16G
D202	A D 16G
D203	A D 16G
D2001	A D 7M
D2201	A D 15K
D2251	A D 15G
D3001	A D 12H
D3002	A D 6F
D3003	A D 8D
D3004	A D 5C
D3005	A D 9C
D3006	A D 7F
D3007	A D 10E
D3008	A D 10E
D4001	A D 14H
D4002	A D 14G
D5001	A D 2M
D5101	A D 3K
D5102	A D 3K
D5103	A D 3L
D5104	A D 3M
D5105	A D 2K
D5201	A D 1I
D5203	A D 3I
D5204	A D 2I
D5205	A D 3I
D5207	A D 2I
D5210	A D 3I
D5211	A D 2H
D5212	A D 2I
D5301	A D 2I
D5302	A D 2F
D5303	A D 1F
D5304	A D 1F
D5306	A D 1F
D5307	A D 3H
D5308	A D 3F
D5309	A D 4D
D5310	A D 4H
D5311	A D 5D
D6002	A D 21M
D7002	A D 14A
D7003	A D 9B
D7008	A D 15B
D7009	A D 5B
D7010	A D 5B
D7101	A D 17O
D7102	A D 17O
D7151	A D 19M
IC	
IC1	B C 12M
IC201	A D 19F
IC7001	A D 8J
IC2201	B C 16M
IC3001	B C 13F
IC3002	B C 15E
IC3003	A D 16E
IC3004	A D 7M
IC5301	A D 1E
IC6080	B C 22J
IC7001	B C 12B
IC7002	A D 8A
IC7151	A D 20K
JACK	
J7101	A D 16P
J7102	A D 12P
J7103	A D 21P
J7104	A D 20P
J7105	A D 20A
COIL	
L1	A D 12O
L2	A D 14L
L4	A D 14J
L7	A D 10K
L8	A D 10N
L9	A D 9O
L16	A D 14L
L17	A D 13L
L18	A D 13K
L20	A D 10K
L24	A D 11K
L104	A D 10L
L106	A D 9L
L151	A D 12J
L181	A D 9L
L201	A D 18F
L202	A D 19E
L203	A D 19F
L204	A D 17G
L206	A D 19H
L301	A D 6K
L302	A D 7K
L303	A D 7J
L2001	A D 12O
L2201	A D 15K
L2251	A D 14N
L2252	A D 14M
L3001	A D 6M
L5201	A D 3G
L5202	A D 2F
L5301	A D 4D
L6001	A D 21M
L6002	A D 21O
L6003	A D 21N
L6051	A D 21I
L6051	A D 21O
L6080	A D 21J
L7101	B C 17P
L7102	B C 13P
L7103	B C 20P
L7104	A D 20A
L7151	A D 20J
L7153	A D 20K
L7155	A D 21L
TRANSISTOR	
Q1	B C 13J
Q31	B C 9N
Q34	B C 13N
Q35	B C 13N
Q36	B C 13O
Q37	B C 12O
Q38	B C 11K
Q39	B C 11K
Q51	B C 14M
Q52	B C 11K
Q106	B C 9L
Q151	B C 13L
Q152	B C 13M
Q153	B C 12K
Q154	B C 12K
Q155	B C 13J
Q157	B C 9M
Q158	B C 9K
Q159	B C 9K
Q183	B C 9J
Q301	B C 7K
Q302	B C 8J
Q311	B C 8J
Q312	B C 8K
Q313	B C 7I
Q2001	B C 10O
Q2002	B C 10O
Q2003	B C 10O
Q2051	B C 9M
Q2052	B C 8M
Q2053	B C 8M
Q2054	B C 8M
Q2055	B C 8M
Q2151	B C 15J
Q2152	B C 15J
Q2251	B C 14N
Q2252	B C 15N
Q2253	B C 14M
Q3001	A D 6M
Q3002	A D 4I
Q3003	A D 19I
Q3004	B C 9D
Q3005	B C 5D
Q3006	B C 10P
Q3007	B C 9E
Q3008	B C 9E
Q4001	A D 8M
Q5101	A D 2L
Q5102	A D 3L
Q5303	A D 3D
Q5304	A D 3G
Q5305	B C 3G
Q5306	A D 2F
Q5307	B C 3E
Q5308	B C 3E
Q5309	B C 3E
Q5310	B C 4E
Q5311	B C 2D
Q5312	B C 1E
Q6030	B C 21K
Q6031	B C 21K
Q6032	B C 21H
Q6033	B C 21H
Q6035	B C 21H
Q7101	B C 18J
Q7102	B C 16O
Q7151	B C 19M
Q7152	B C 19M
Q7153	B C 15F
Q7154	B C 15F
Q7155	B C 20N
Q7156	B C 20N
RESISTOR	
R1	B C 13M
R2	B C 14K
R3	B C 13K
R4	B C 14J
R5	B C 13K
R6	B C 13K
R20	B C 10L
R21	B C 9M
R22	B C 9M
R23	B C 9N
R24	B C 10N
R25	B C 10N
R52	A D 12O
R62	A D 8L
R63	B C 12K
R102	B C 9H
R107	B C 12L
R110	B C 10N
R120	B C 14J
R121	B C 14N
R122	B C 11K
R123	B C 11K
R124	B C 6J
R131	B C 13L
R151	B C 14L
R152	B C 12K
R153	B C 14L
R154	B C 12K
R155	B C 14L
R156	B C 12K
R157	B C 12J
R158	B C 12J
R159	B C 11J
R161	B C 9L
R162	B C 9L
R163	B C 9L
R164	B C 9L
R165	B C 9L
R166	B C 9K
R167	B C 9J
R181	B C 9M
R186	B C 13L
R190	B C 11K
R191	B C 11J
R192	B C 10M
R193	B C 12J
R194	B C 8K
R202	B C 16Q
R203	B C 16Q
R204	B C 16G
R209	B C 18G
R210	B C 17F
R211	B C 19H
R213	B C 19H
R214	B C 16H
R216	B C 19G
R218	B C 18H
R219	B C 17G
R223	B C 19H
R301	B C 8J
R302	B C 7J
R303	B C 7K
R304	B C 8K
R305	B C 8K
R306	B C 7K
R307	B C 8K
R308	B C 7K
R309	B C 6J
R310	B C 7J
R311	B C 8J
R312	B C 8J
R313	B C 8J
R314	B C 8J
R315	B C 8J
R316	B C 8J
R321	B C 8K
R322	B C 6J
R323	B C 7J
R324	B C 8I
R325	B C 7I
R326	B C 7J
R327	B C 8I
R328	B C 8I
R329	B C 7J
R2001	B C 12O
R2002	A D 9L
R2003	B C 12N
R2004	B C 12O
R2005	B C 11O
R2006	B C 11O
R2007	B C 11O
R2009	B C 11O
R2010	B C 11O
R2011	B C 11N
R2012	B C 11N
R2013	B C 11N
R2014	B C 11N
R2015	B C 10O
R2016	B C 10O
R2018	B C 10O
R2019	B C 10O
R2051	B C 9N
R2052	B C 9N
R2053	B C 9N
R2054	B C 8M
R2055	B C 9M
R2056	B C 8M
R2057	B C 8M
R2058	B C 8M
R2059	B C 8M
R2060	B C 8M
R2151	B C 15J
R2152	B C 16J
R2201	B C 17N
R2202	B C 17N
R2203	B C 17M
R2204	B C 17N
R2205	B C 17N
R2206	B C 16N
R2207	B C 16N
R2208	B C 16O
R2209	B C 16O
R2210	B C 16O
R2211	B C 16O
R2212	B C 16N
R2213	B C 16N
R2214	B C 16N
R2215	B C 16N
R2216	B C 16N
R2217	B C 16N
R2218	B C 16K
R2219	B C 16K
R2220	B C 16K
R2221	B C 16K
R2222	B C 16K
R2223	B C 17L
R2224	B C 17L
R2225	B C 17L
R2226	B C 17L
R2227	B C 17L
R2228	B C 17M
R2236	B C 15N
R2237	B C 15N
R2238	B C 15M
R2239	B C 15L
R2240	B C 15L
R2251	B C 15L
R2254	B C 14J
R3011	A D 11G
R3012	A D 11G
R3013	A D 10F
R3015	A D 11F
R3016	A D 10G
R3017	A D 10G
R3019	A D 10F
R3020	A D 11F
R3021	A D 11F
R3022	A D 10G
R3025	B C 10F
R3026	B C 10F
R3027	B C 10F
R3029	B C 9E
R3030	B C 10E
R3031	B C 10E
R3033	B C 9E
R3034	B C 9E
R3035	B C 9E
R3036	B C 10E
R3037	B C 9D
R3038	B C 9D
R3039	B C 10D
R3040	B C 10D
R3041	B C 9D
R3042	B C 10D
R3044	B C 10D
R3046	B C 11E
R3047	B C 11D
R3048	B C 11D
R3049	B C 11D
R3050	B C 11D
R3051	B C 12D
R3052	B C 12D
R3053	B C 12D
R3054	B C 13D
R3055	B C 13C
R3056	B C 13D
R3057	B C 15D
R3058	B C 13D
R3060	B C 14D
R3061	B C 13D
R3062	B C 13D
R3068	B C 15E
R3069	B C 14E
R3071	B C 14E
R3072	B C 15E
R3073	B C 15E
R3074	B C 15E
R3075	B C 15E
R3076	B C 15E
R3080	B C 15F
R3081	B C 14F
R3083	B C 14F
R3085	B C 14F
R3086	B C 14F
R3087	B C 15F
R3088	B C 15F
R3089	B C 15F
R3091	B C 16G
R3092	B C 16G
R3093	B C 16G
R3094	B C 15G
R3095	B C 15G
R3097	B C 15G
R3098	B C 14G
R3104	B C 14G
R3105	B C 14G
R3201	B C 6M
R3202	B C 6M
R3203	B C 6M
R3204	B C 5M
R3205	A D 11H
R3206	B C 8F
R3207	A D 16B
R3208	B C 16F
R3209	B C 16F
R3210	B C 9G
R3211	B C 8G
R3212	B C 6G
R3213	A D 7F
R3214	B C 9E
R3215	B C 9E
R3216	B C 9E
R3217	B C 9E
R3218	A D 7F
R3219	B C 7F
R3220	B C 9D
R3221	B C 7F
R3222	B C 5D
R3223	B C 16D
R3224	B C 15E
R3225	A D 16B
R3226	B C 13D
R3227	B C 14D
R3228	B C 14E
R3229	B C 14E
R3230	B C 15E
R3231	B C 15E
R3232	B C 10F
R3233	B C 10E
R3234	B C 10E
R3235	B C 15F
R3236	B C 15F
R3237	B C 8H
R3238	B C 8H
R3239	B C 15J
R3240	B C 15J
R3241	B C 11F
R3242	B C 11I
R4001	A D 16G
R4002	B C 12G
R4003	B C 12G
R4004	B C 12G
R4005	B C 9G
R4006	B C 9G
R4007	B C 8G
R4008	B C 10F
R4009	B C 14G
R4010	B C 14G
R4011	B C 14G
R4012	B C 14G
R4013	B C 13G
R4014	B C 14G
R4015	B C 14G
R4016	B C 13G
R4017	B C 12G
R4018	B C 12G
R4019	B C 12G
R4020	A D 7G
R4021	A D 12H
R5101	A D 3M
R5102	A D 3M
R5103	A D 3M
R5104	A D 4N
R5106	A D 2L
R5107	A D 1K
R5108	A D 3L
R5109	A D 2K
R5110	A D 1L
R5111	A D 3L
R5112	A D 1K
R5301	A D 1C
R5302	A D 4F
R5303	A D 4F
R5304	A D 1F
R5305	A D 4H
R5306	A D 4E
R5307	A D 1H
R5310	B C 3F
R5311	B C 3F
R5312	B C 1E
R5313	A D 3H
R5314	B C 2D
R5315	B C 3E
R5316	B C 4F
R5317	B C 4F
R5318	A D 2D
R5319	B C 4D
R5320	B C 2D
R5321	B C 4H
R5322	B C 3H
R5323	A D 3H
R5324	B C 5E
R5325	B C 3E
R5326	B C 3E
R5327	B C 3E
R6020	B C 21N
R6021	B C 21N
R6022	B C 21M
R6023	B C 21M
R6030	B C 21J
R6031	B C 21K
R6032	B C 21K
R6033	B C 21I
R6035	B C 21H
R6037	B C 21I
R6038	B C 21L
R6039	A D 21H
R6050	B C 21H
R6051	A D 21P
R6052	A D 21O
R6080	B C 21J
R6081	B C 21J
R7001	B C 10B
R7002	B C 10B
R7003	B C 10B
R7004	B C 10B
R7005	A D 14B
R7006	A D 14B
R7007	B C 5B
R7008	A D 5B
R7009	B C 14A
R7010	B C 14A
R7011	B C 13B
R7012	B C 13B
R7013	B C 14A
R7014	A D 8B
R7015	B C 9E
R7016	B C 16A
R7017	A D 9B
R7020	B C 14B
R7021	B C 17B
R7022	A D 7B
R7023	B C 7B
R7024	B C 7B
R7025	B C 6B
R7026	B C 8B
R7030	B C 14B
R7031	B C 6B
R7032	B C 6B
R7033	B C 3B
R7034	B C 3B
R7035	B C 2B
R7036	B C 2B
R7037	B C 3B
R7040	B C 5B
R7041	B C 5B
R7042	B C 5C
R7101	B C 15P
R7102	B C 20M
R7103	B C 17P
R7104	B C 18P
R7105	B C 18P
R7106	B C 18P
R7107	B C 17P
R7108	B C 11Q
R7109	B C 10P
R7110	B C 13P
R7111	B C 14P
R7112	B C 14P
R7113	B C 17P
R7114	B C 13P
R7115	B C 19P
R7116	B C 18P
R7117	B C 18P
R7118	B C 19N
R7119	B C 19N
R7120	B C 8H
R7121	B C 21O
R7122	B C 20O
R7123	B C 20O
R7124	B C 20O
R7127	B C 20P
R7128	B C 21O
R7129	B C 19O
R7130	B C 20P
R7131	B C 21B
R7132	B C 19A
R7133	B C 20A
R7134	B C 20A
R7151	B C 20M
R7152	B C 20M
R7153	B C 20L
R7154	B C 19M
R7155	B C 20L
R7157	B C 19K
R7158	B C 19L
R7159	B C 19L
R7160	B C 19K
R7161	B C 19K
R7162	B C 15F
R7163	B C 20N
R7164	B C 20N
R7165	B C 17J
SWITCH	
S3001	A D 18C
S7001	A D 22B
S7002	A D 18B
S7003	A D 16B
S7004	A D 7B
S7005	A D 6B
S7006	A D 6B
S7008	A D 5B
S7010	A D 4B
S7011	A D 4B
S7012	A D 3B
S7013	A D 2B
S7014	A D 1F
S7015	A D 1B
S7016	A D 17B
TEST POINT	
TP106	A D 6P
TP111	A D 20E
TP2033	A D 6P
TP2253	B C 20G
TP3901	B C 11D
TP3902	B C 11D
TP3903	B C 13D
TP3904	B C 14E
TP3905	B C 14D
TP4001	A D 5P
TP7001	A D 3A
TPGND	A D 17A
OTHER	
CP3001	A D 6L
CP4001	A D 7O
CP5301	A D 1F
PC3002	A D 8G
F5001	A D 2P
FW7001	A D 18B
FW7101	A D 20H
K5101	A D 3K
LF5001	A D 4O
LF5002	A D 2N
PC3001	A D 16F
PC3002	A D 8G
PC5101	A D 4L
PC5301	A D 2E
T2051	A D 9N
T5001	A D 1K
TU6001	A D 22P
VA5001	A D 4O
WR1	A D 13J
X1	A D 13L
X2	A D 13L
X3001	A D 13D
X3002	A D 14E

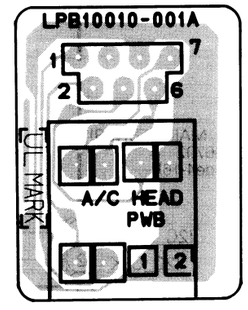
4.10 MAIN, A/C HEAD, LED AND SHUTTLE CIRCUIT BOARDS



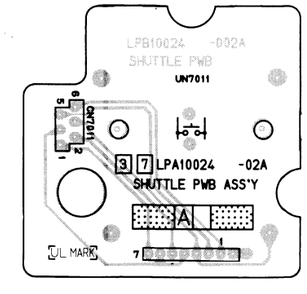
— LED —



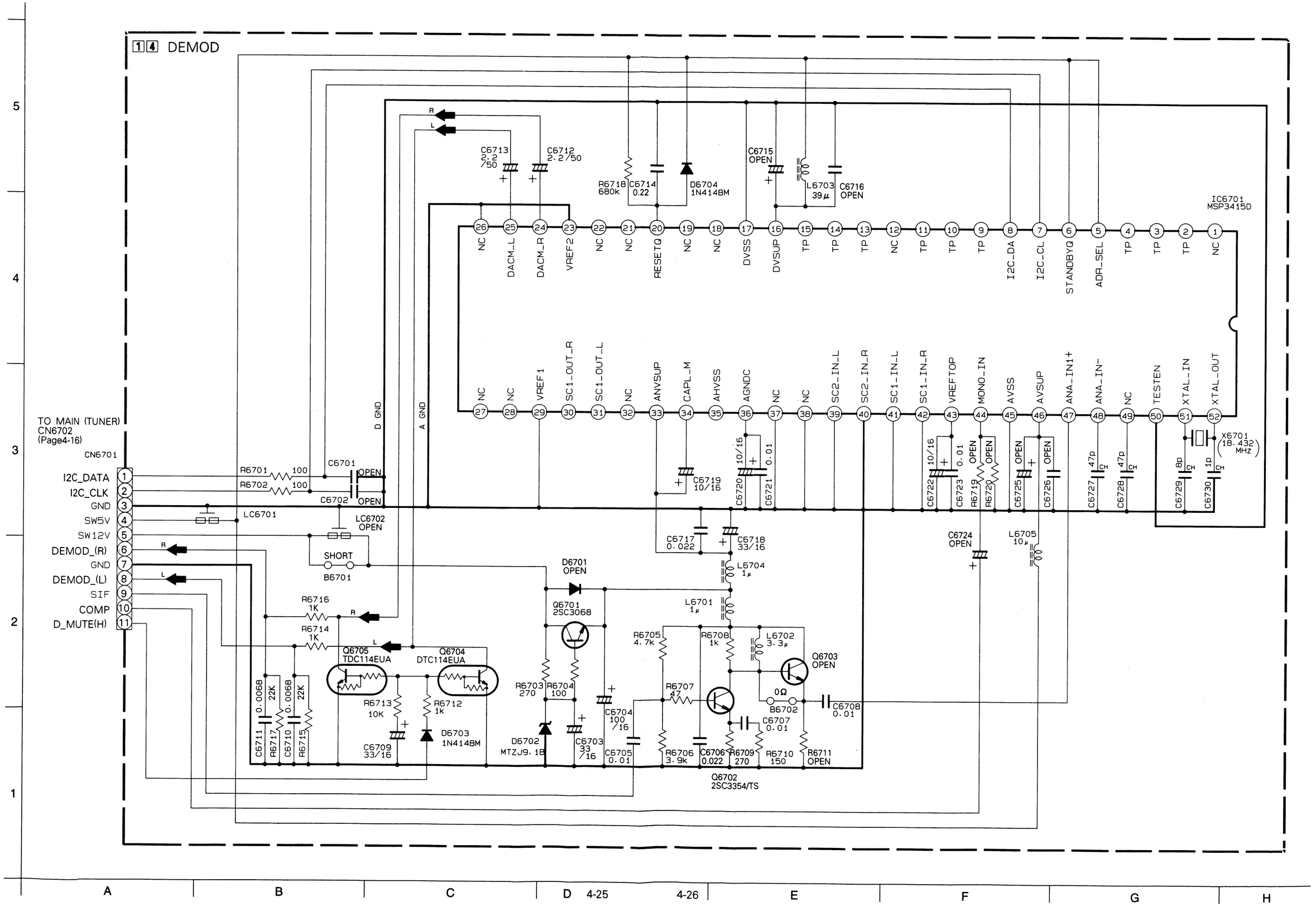
— A/C HEAD —



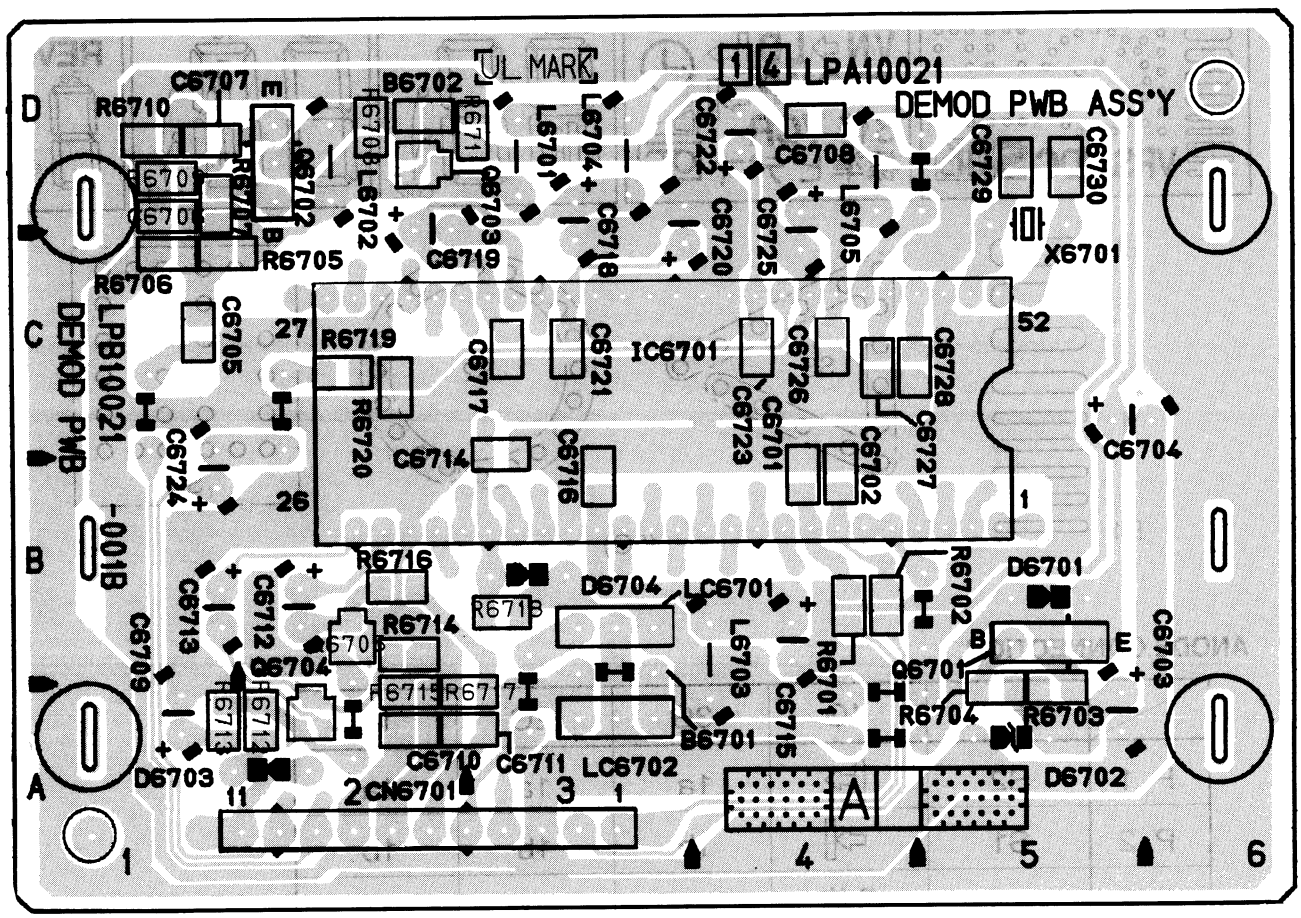
— SHUTTLE —
[HR-J768EU]



4.11 DEMODULATOR SCHEMATIC DIAGRAM



4.12 DEMODULATOR CIRCUIT BOARD

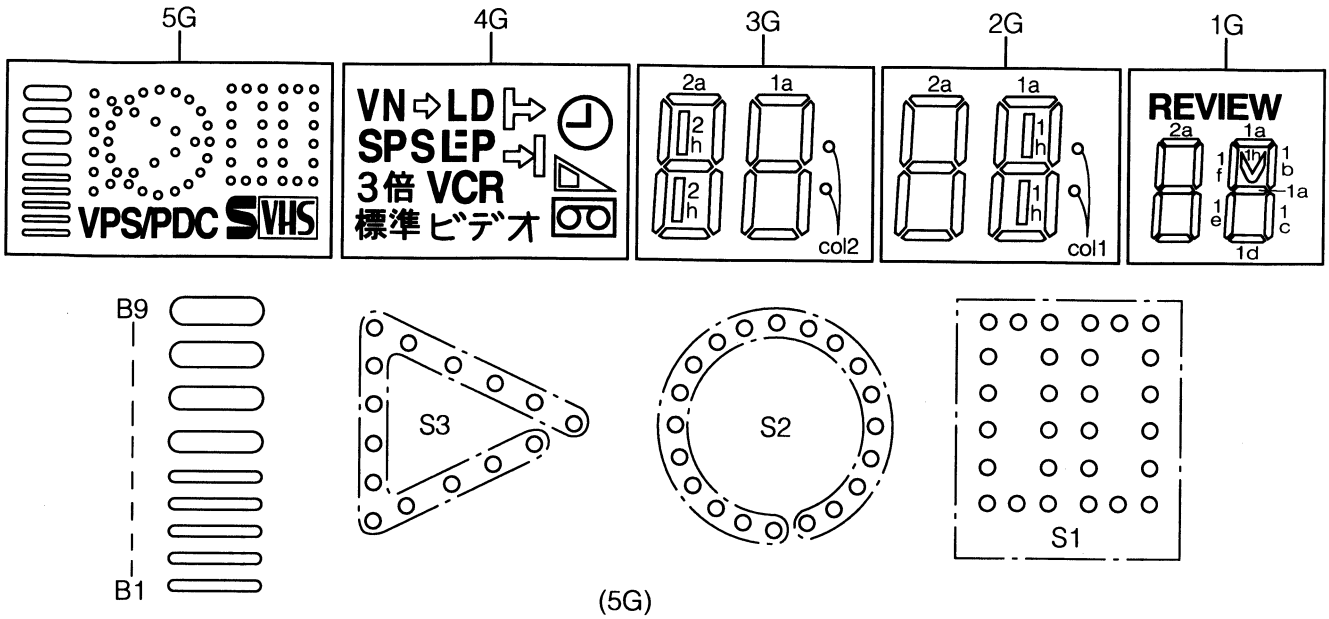


COMPONENT PARTS LOCATION GUIDE <DEMODULATOR>

REF.NO.	LOCATION		
CAPACITOR			
C6701	B	C	4B
C6702	B	C	4B
C6703	A	D	5A
C6704	A	D	5C
C6705	B	C	1C
C6706	B	C	1D
C6707	B	C	1D
C6708	B	C	4D
C6709	A	D	1A
C6710	B	C	2A
C6711	B	C	3A
C6712	A	D	2B
C6713	A	D	1B
C6714	B	C	3C
C6715	A	D	4B
C6716	B	C	3B
C6717	B	C	3C
C6718	A	D	3D
C6719	A	D	2D
C6720	A	D	4C
C6721	B	C	3C
C6722	A	D	4D
C6723	B	C	4C
C6724	A	D	1B
C6725	A	D	4D
C6726	B	C	4C
C6727	B	C	4C
C6728	B	C	5C
C6729	B	C	5D
C6730	B	C	5D
CONNECTOR			
CN6701	A	D	3A
DIODE			
D6701	A	D	5B
D6702	A	D	5A
D6703	A	D	2A
D6704	A	D	3B
IC			
IC6701	A	D	5B
COIL			
L6701	A	D	3D
L6702	A	D	2D
L6703	A	D	4A
L6704	A	D	3D
L6705	A	D	4D
TRANSISTOR			
Q6701	A	D	5B
Q6702	A	D	2D
Q6703	B	C	2D
Q6704	B	C	2A
Q6705	B	C	2B
RESISTOR			
R6701	B	C	4B
R6702	B	C	4B
R6703	B	C	5A
R6704	B	C	5A
R6705	B	C	2C
R6706	B	C	1C
R6707	B	C	1D
R6708	B	C	2D
R6709	B	C	1D
R6710	B	C	1D
R6711	B	C	3D
R6712	B	C	2A
R6713	B	C	2A
R6714	B	C	2B
R6715	B	C	2A
R6716	B	C	2B
R6717	B	C	3A
R6718	B	C	3B
R6719	B	C	2C
R6720	B	C	2C
OTHER			
LC6701	A	D	3B
LC6702	A	D	3A

4.13 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT



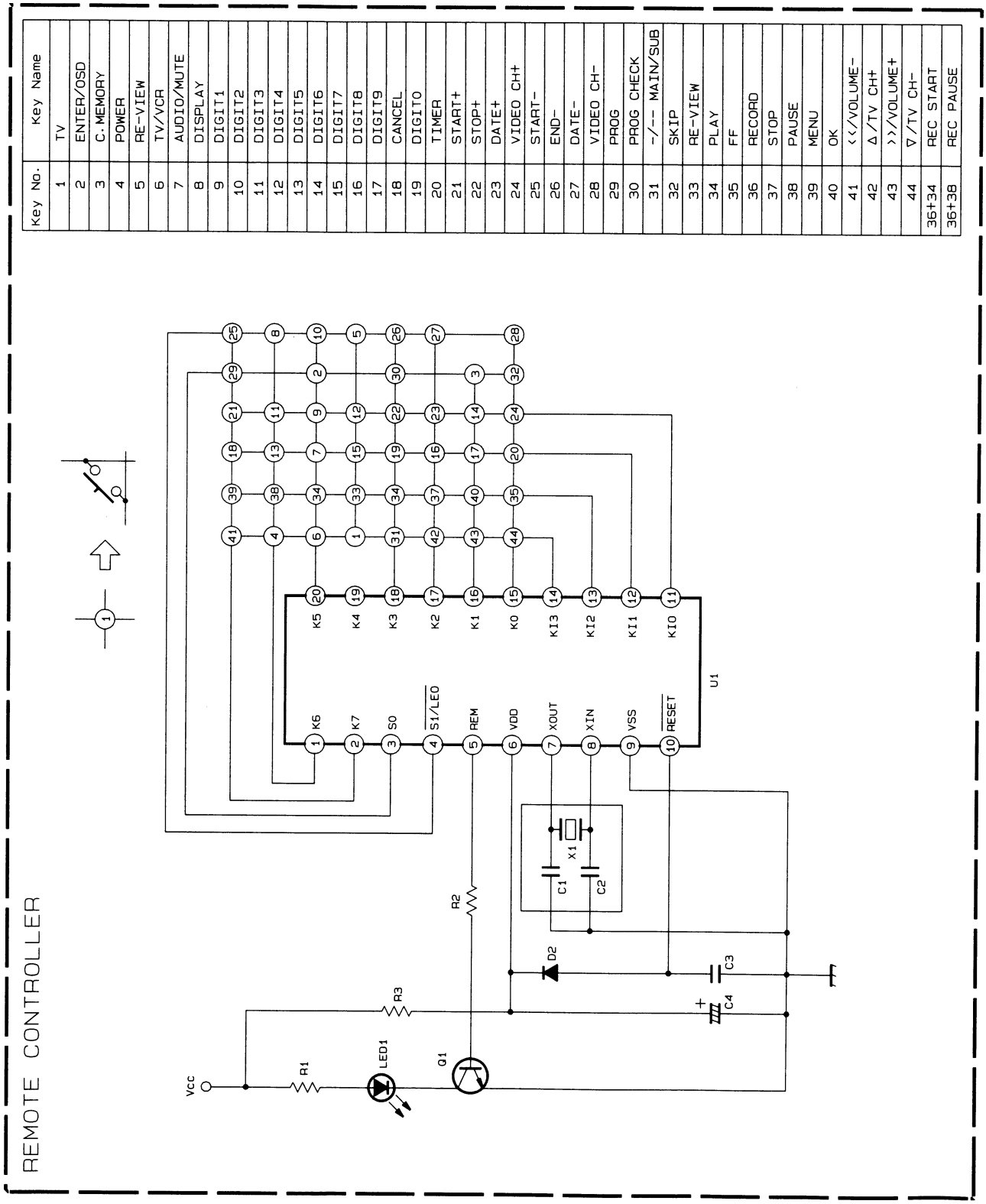
ANODE CONNECTION

	5G	4G	3G	2G	1G
P 1	S2	⇨	1a	1a	1a
P 2	S1	⇨|	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	VPS/PDC	標準	1g	1g	1g
P 5	SVHS	◴	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	⊡	1d	1d	1d
P 8	B9	VCR	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	VN	2f	2f	2f
P12	B5	LD	2g	2g	2g
P13	B4	SP	2c	2c	2c
P14	B3	S (SEP)	2e	2e	2e
P15	B2	: (SEP)	2d	2d	2d
P16	B1	LP (SEP)	2h	col1	REVIEW

4.14 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

Key No.	Key Name
1	TV
2	ENTER/OSD
3	C.MEMORY
4	POWER
5	RE-VIEW
6	TV/VCR
7	AUDIO/MUTE
8	DISPLAY
9	DIGIT1
10	DIGIT2
11	DIGIT3
12	DIGIT4
13	DIGIT5
14	DIGIT6
15	DIGIT7
16	DIGIT8
17	DIGIT9
18	CANCEL
19	DIGIT0
20	TIMER
21	START+
22	STOP+
23	DATE+
24	VIDEO CH+
25	START-
26	END-
27	DATE-
28	VIDEO CH-
29	PROG
30	PROG CHECK
31	-/-- MAIN/SUB
32	SKIP
33	RE-VIEW
34	PLAY
35	FF
36	RECORD
37	STOP
38	PAUSE
39	MENU
40	OK
41	<</VOLUME-
42	Δ/TV CH+
43	>>/VOLUME+
44	∇/TV CH-
36+34	REC START
36+38	REC PAUSE



4.15 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.5	2.5
2	2.5	2.5
3	0	0
4	2.2	2.5
5	0	0
6	2.8	2.8
7	2.5	2.5
8	2.5	2.5
9	2.5	2.5
10	2.5	2.5
11	2.5	2.5
12	5.0	5.0
13	1.9	1.5
14	1.9	1.5
15	2.6	3.0
16	1.5	0.8
17	0.3	0.7
18	2.3	2.3
19	3.0	3.0
20	2.8	2.8
21	2.3	2.3
22	1.9	2.1
23	3.0	3.0
24	2.1	2.1
25	1.4	1.4
26	2.1	2.1
27	0	0
28	2.8	2.8
29	1.9	1.9
30	2.8	2.8
31	2.8	2.8
32	0	0
33	0	0
34	0	0
35	3.1	3.1
36	5.1	5.1
37	0	0
38	5.1	5.1
39	3.3	3.3
40	5.1	5.1
41	5.1	5.1
42	2.0	2.0
43	5.1	5.1
44	2.6	2.6
45	0	0
46	2.0	2.0
47	0	0
48	0	0
49	0	0
50	0.4	0.4
51	0.1	0.1
52	2.3	2.3
53	2.8	2.8
54	2.0	2.0

MODE PIN NO.	REC	PLAY
55	2.1	2.1
56	2.3	2.3
57	0	0
58	3.1	3.1
59	2.8	2.8
60	2.1	2.1
61	5.0	5.0
62	5.1	5.1
63	5.0	5.0
64	0	0
65	1.1	2.3
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.8	2.8
70	2.6	2.6
71	2.1	2.1
72	2.3	2.3
73	-	-
74	2.6	1.0
75	-	-
76	2.3	2.3
77	4.7	4.7
78	2.7	2.7
79	4.4	2.0
80	0	0
81	-	-
82	1.2	1.2
83	2.3	2.3
84	0	2.0
85	0	0
86	2.4	2.2
87	2.4	2.2
88	2.5	2.3
89	2.5	2.3
90	5.0	5.0
91	0	0
92	0	0
93	0	0
94	0	0
95	0.4	0.4
96	5.0	5.0
97	0	0
98	5.1	5.1
99	0.5	2.6
100	2.5	2.5
Q34		
E	2.4	2.2
C	2.4	2.2
B	0	0
Q35		
E	2.5	2.2
C	2.5	2.2
B	0	0
Q36		

MODE PIN NO.	REC	PLAY
E	0	0
C	0	0
B	0.7	0.7
Q37		
E	0	0
C	0	0
B	0.7	0.7
Q38		
E	1.7	1.7
C	5.0	5.0
B	2.3	2.3
Q39		
E	2.3	2.3
C	0	0
B	1.7	1.7
Q152		
E	5.0	2.7
C	0	0
B	4.4	2.0
Q2001		
E	-12.7	0
C	0	0
B	-19.2	0.7
Q2002		
E	-12.7	0
C	0	0
B	-18.9	0.7
Q2003		
E	5.1	5.1
C	-19.0	5.0
B	5.0	0
Q2051		
E	0	0
C	8.2	0.2
B	0.5	0.2
Q2052		
E	11.8	11.8
C	11.6	0.6
B	11.0	11.7
Q2053		
E	0	0
C	0	11.7
B	5.0	0
Q2054		
E	11.6	0.6
C	11.4	0.1
B	10.8	0.6
Q2055		
E	0	0
C	0	0.6
B	5.0	0
CN1		
1	0	0
2	0	0
3	0	0

MODE PIN NO.	REC	PLAY
4	0	0
5	2.5	2.2
6	2.5	2.2
7	2.4	2.2
8	2.4	2.2
9	2.6	0
10	2.5	0
11	2.5	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.6
7	2.5	2.5
CN2002		
1	0	0
2	0	0

<ON SCREEN>

MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.7	2.7
3	5.1	5.1
4	0	0
5	4.4	4.4
6	2.5	2.5
7	2.5	2.5
8	5.1	5.1
9	3.1	3.2
10	4.6	4.6
11	3.7	0.9
12	5.1	5.1
13	3.0	3.0
14	3.0	3.0
15	0	0
16	1.3	1.3
17	0	0
18	5.1	5.1
19	2.3	2.3
20	0	0
21	2.3	2.3
22	0.5	0.5
23	5.1	5.1
24	2.9	2.9
25	2.5	2.5
26	5.1	5.1
27	4.4	4.4
28	3.7	3.7

MODE PIN NO.	REC	PLAY
29	5.1	5.1
30	5.1	5.1

<FMA>

MODE PIN NO.	REC	PLAY
IC2201		
1	2.4	2.4
2	0	0
3	2.4	2.4
4	0	0
5	0	0
6	2.5	2.5
7	2.0	2.0
8	0	0
9	0	0
10	0	0
11	0	0
12	2.0	2.0
13	0	0
14	0	0
15	0	0
16	2.5	2.5
17	0.4	0.4
18	2.5	2.5
19	2.5	2.5
20	2.6	0.1
21	2.5	0
22	2.6	0.6
23	0	0
24	2.6	0.6
25	5.0	5.0
26	2.6	0
27	2.6	-
28	4.3	0
29	4.3	1.9
30	4.4	1.9
31	0.9	3.2
32	2.5	2.5
33	2.5	2.5
34	0.7	0.3
35	2.5	2.5
36	0	0.2
37	1.7	1.7
38	0	0
39	0	0
40	5.0	5.0
41	0	0
42	5.1	5.1
43	5.0	5.0
44	3.2	3.2
45	0	0
46	4.9	4.9

MODE PIN NO.	REC	PLAY
47	2.5	2.5
48	2.5	2.5
49	0.2	0.2
50	0.7	0.7
51	0	0
52	0	0
53	4.5	4.5
54	0	0
55	0	0
56	0	0
57	4.5	4.5
58	9.3	9.3
59	4.7	4.7
60	0	0.9
61	2.5	2.5
62	2.4	2.4
63	4.6	4.6
64	4.7	4.7
Q2151		
E	5.0	5.0
C	5.0	5.0
B	2.8	2.8
Q2152		
E	5.1	5.1
C	5.0	5.0
B	0	0.2
Q2253		
E	-	-
C	-	-
B	-	-

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	2.9	2.6
2	0	0
3	2.0	2.5
4	2.6	2.6
5	2.6	2.6
6	2.6	2.6
7	2.5	2.5
8	2.6	2.6
9	5.1	5.1
10	5.1	5.1
11	0.2	0.2
12	0.3	0.4
13	0	1.7
14	5.0	5.0
15	5.0	5.0
16	0.2	0.2
17	0.3	0.4
18	5.1	5.1

MODE PIN NO.	REC	PLAY
19	0	0
20	4.6	4.6
21	4.1	4.1
22	4.2	4.2
23	0	0
24	5.0	5.0
25	0	0
26	5.2	5.2
27	5.2	5.2
28	5.1	5.1
29	5.1	5.1
30	0	0
31	5.0	5.0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	4.9	4.9
38	5.1	5.1
39	0.3	0.3
40	0	0
41	5.2	5.2
42	4.7	4.7
43	0	0
44	4.9	4.9
45	5.1	5.1
46	5.0	5.0
47	5.2	5.2
48	5.0	5.0
49	5.0	5.0
50	5.0	5.0
51	5.2	5.2
52	3.6	0.9
53	4.6	4.6
54	-	-
55	-	-
56	0	0
57	0	0
58	0	0
59	3.0	3.0
60	0	0
61	0	0
62	0	0
63	0	0
64	-	-
65	-	-
66	-	-
67	-	-
68	0	0
69	-	-
70	5.1	5.1
71	5.1	5.1
72	5.0	5.0
73	5.0	5.1

MODE PIN NO.	REC	PLAY
74	0	0
75	4.3	4.3
76	4.4	4.4
77	0	0
78	0	0
79	0	0
80	0	0
81	0	0
82	5.1	5.1
83	4.9	4.9
84	0	0
85	0	0
86	4.8	4.8
87	5.1	0
88	5.0	0
89	0	0
90	0	0
91	3.1	3.1
92	5.1	5.1
93	5.1	5.1
94	0	0
95	0	0
96	0	0
97	5.1	0
98	0.3	0.3
99	-	-
100	-	-
101	2.5	2.5
102	1.3	1.3
103	0	0
104	0	0
105	0	5.1
106	0	0
107	0	0
108	1.6	1.6
109	5.1	5.1
110	0	0
111	0	0
112	2.6	2.6
IC3002		
1	5.1	5.1
2	5.1	5.1
3	0	0
IC3003		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.4	4.4
6	4.4	4.4
7	0	0
8	5.2	5.2
IC3004		
1	0	0
2	12.5	12.5

MODE PIN NO.	REC	PLAY
3	0.2	0.2
4	-	-
5	0	0
6	12.5	12.5
7	0.3	0.3
8	12.5	12.5
9	0	0
Q3001		
E	0	0
C	12.5	12.5
B	0	0
Q3002		
E	0	0
C	5.0	5.0
Q3003		
E	0	0
C	5.0	5.0
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	5.1	5.1
C	5.9	5.9
B	5.8	5.8
Q3006		
E	0	0
C	5.0	5.0
B	0	0
Q3008		
E	0	0
C	5.0	5.0
B	0	0
Q4001		
E	0	0
C	0	0
B	5.0	5.0
CN3001		
1	12.4	12.4
2	0	0
3	1.4	1.4
4	0	0
5	1.6	1.6
CN3002		
1	0.1	0.1
2	0.1	0.1
CN3003		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.1	5.1
5	0	0
6	5.1	5.1
7	-	-
8	12.4	12.4

MODE PIN NO.	REC	PLAY
CN3004		
1	5.2	5.2
2	5.2	5.2
3	0	0
4	0	0

<SW.REG>

MODE PIN NO.	REC	PLAY
IC5301		
1	6.0	6.0
2	5.1	5.1
3	4.8	4.8
4	0	0
5	12.4	12.4
6	11.8	11.8
7	12.5	12.5
8	12.5	12.5
9	1.3	1.3
10	11.2	11.2
Q5101		
S	-	-
D	150.0	-
G	-	-
Q5102		
E	0	0
C	-	-
B	-	-
Q5303		
E	5.3	5.3
C	6.0	6.0
B	5.9	5.9
Q5304		
E	11.8	11.8
C	12.5	12.5
B	12.5	12.5
Q5306		
E	12.3	12.2
C	11.6	11.5
B	10.9	10.9
Q5310		
E	0	0
C	0	0
B	4.5	4.6
Q5311		
E	-	-
C	-	-
B	-	-
Q5312		
E	-16.1	-16.1
C	-16.2	-16.2
B	-16.8	-16.9

<TUNER>

MODE PIN NO.	REC	PLAY
IC6080		
1	1.2	1.2
2	1.7	1.7
3	3.6	3.6
4	0	0
5	4.0	4.0
6	4.0	4.0
7	4.0	4.0
8	11.7	11.7
Q6030		
E	0.7	0.7
C	0	0
B	0	0
Q6031		
E	0	0
C	0	0
B	4.6	4.6
Q6032		
E	0	0
C	0	0
B	4.1	4.1
CN6702		
1	4.4	4.4
2	4.4	4.4
3	0	0
4	5.0	5.0
5	11.7	11.7
6	0	0
7	0	0
8	0	0
9	0	0
10	3.6	3.6
11	4.1	4.1

<TERMINAL>

MODE PIN NO.	REC	PLAY
IC7151		
1	1.6	1.6
2	0	0
3	1.6	1.6
4	11.6	11.6
5	1.9	1.8
6	0	0
7	5.2	5.2
8	11.6	11.6
9	5.2	5.2
10	0	0.2
11	5.2	5.2
12	0	0
13	4.4	4.4
14	4.4	4.4
15	5.9	5.9

MODE PIN NO.	REC	PLAY
16	5.2	5.2
17	5.9	5.9
18	5.2	5.2
19	11.6	11.6
20	2.2	2.3
21	1.4	1.1
22	1.4	1.1
23	2.6	2.6
24	2.0	2.0
Q7152		
E	3.0	3.0
C	0	0
B	2.3	2.3
Q7153		
E	5.2	5.2
C	-0.1	-0.1
B	5.1	5.1
Q7154		
E	0	0
C	5.1	5.1
B	0	0
Q7155		
E	0	0
C	0	0
B	0	0
Q7156		
E	0	0
C	0	0
B	0	0

<SW/DISPLAY>

MODE PIN NO.	REC	PLAY
IC7001		
1	5.2	5.2
2	2.2	2.2
3	0	0
4	2.2	2.2
5	5.2	5.2
6	5.1	5.1
7	4.1	4.1
8	5.1	5.1
9	5.1	5.1
10	5.1	5.1
11	5.1	5.1
12	4.9	4.9
13	3.6	0.8
14	5.1	5.1
15	4.7	4.7
16	-29.6	-29.6
17	-29.6	-29.6
18	-29.4	-29.4

MODE PIN NO.	REC	PLAY
19	-29.4	-29.4
20	-29.4	-29.4
21	-25.0	-25.0
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	5.2	5.2
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0
CN7002		
1	-0.2	-0.2
2	0	0
3	-0.2	-0.2
CN7004		
1	5.1	0.5
2	5.1	5.1
3	0	0
4	0	0
5	5.0	0
6	5.0	5.0

<JOG/SHUTTLE>[HR-J768EU]

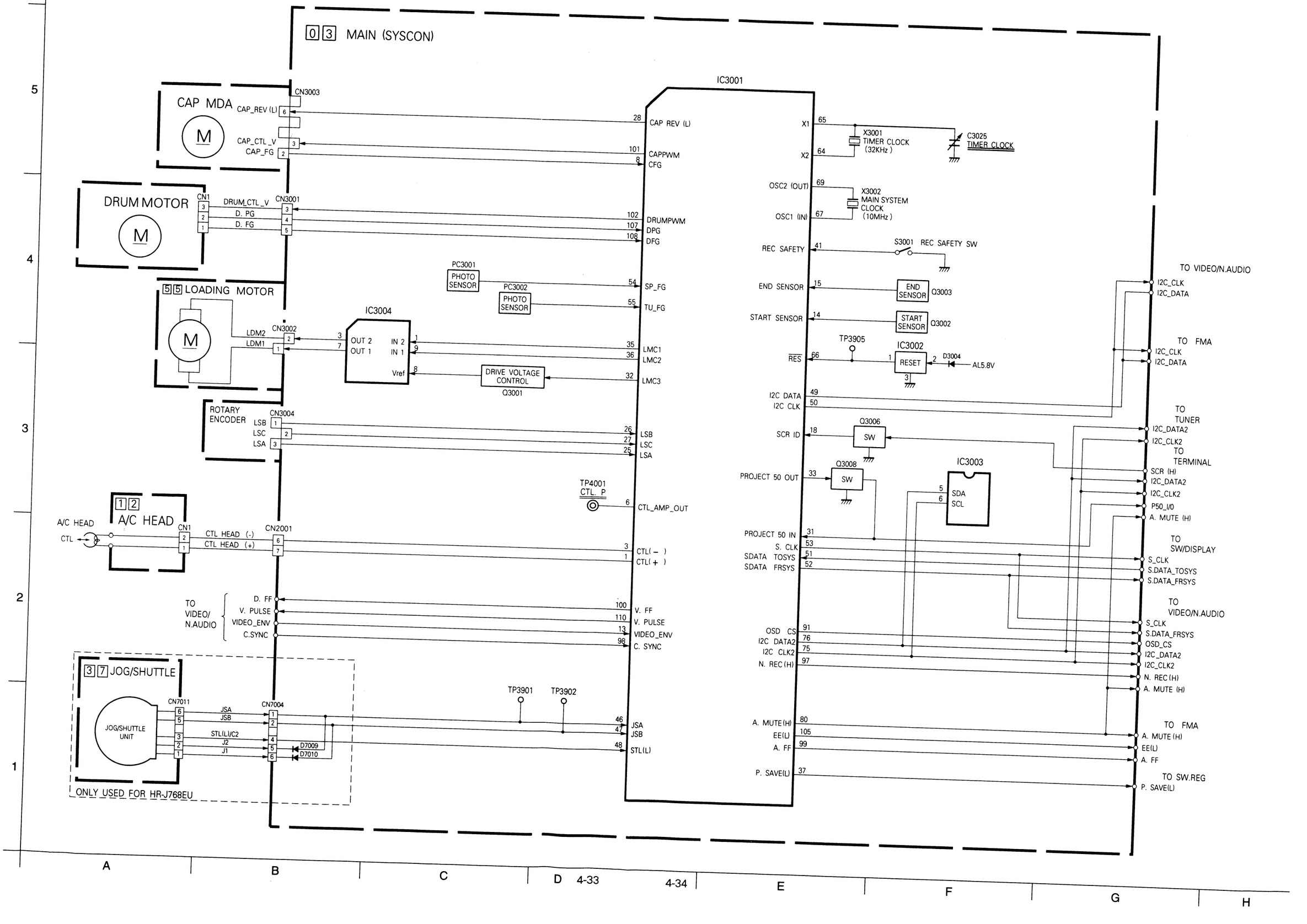
MODE PIN NO.	REC	PLAY
CN7011		
1	5.0	5.0
2	5.0	0
3	0	0
4	0	0
5	5.1	5.1
6	5.1	0.5

<DEMODULATOR>

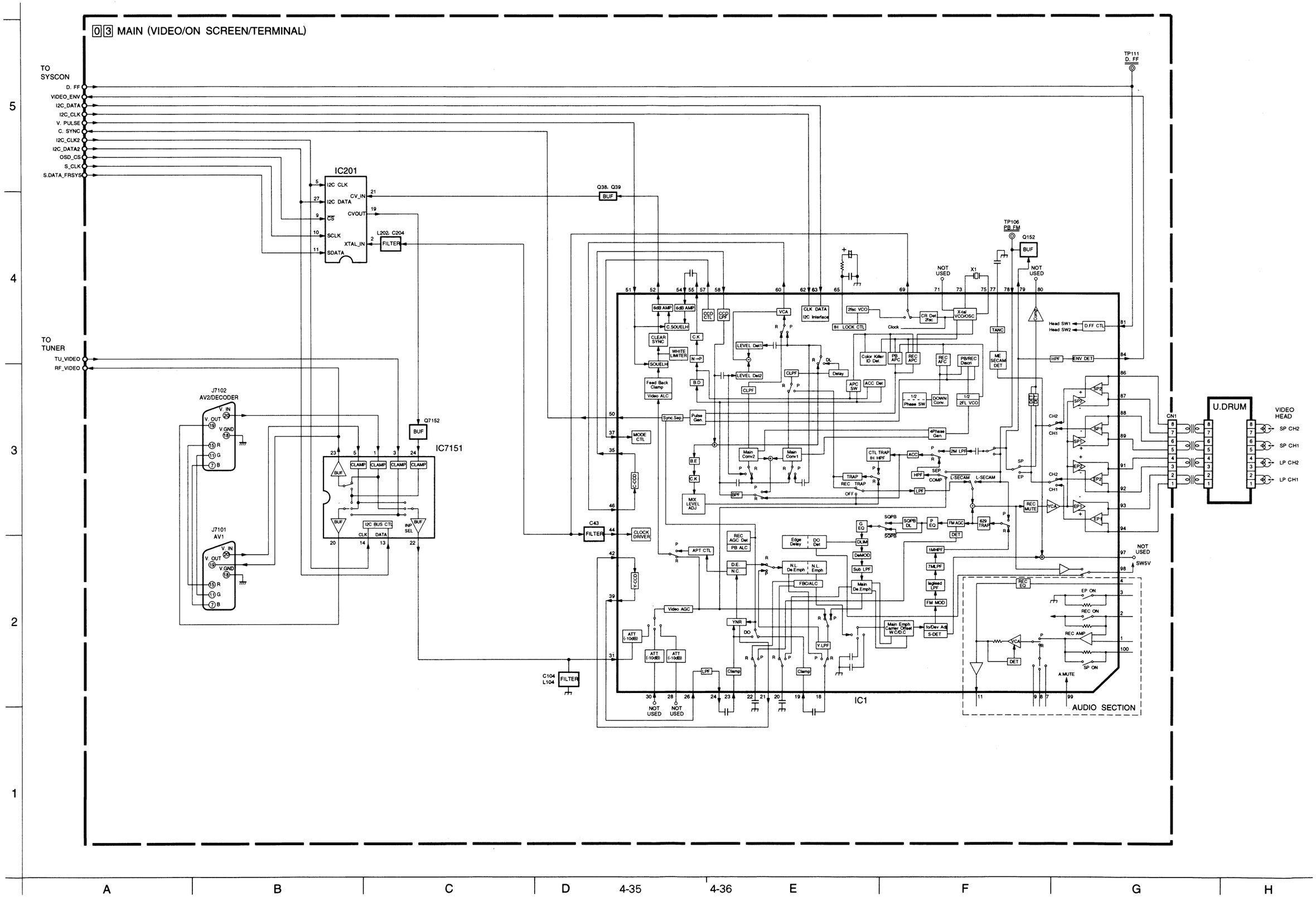
MODE PIN NO.	REC	PLAY
IC6701		
1	0.5	0.5
2	2.5	2.5
3	0	0
4	0	0
5	5.1	5.1
6	5.0	5.0
7	4.4	4.4
8	4.4	4.4
9	0	0
10	0	0
11	0	0
12	0.5	0.5
13	0.5	0.5
14	0.5	0.5
15	0.5	0.5
16	4.8	4.8
17	0	0
18	0.5	0.5
19	0	0
20	4.8	4.8
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	8.3	8.3
31	8.3	8.3
32	0	0
33	8.3	8.3
34	7.4	7.4
35	0	0
36	3.6	3.6
37	0	0
38	0	0
39	0	0
40	0	0
41	0	0
42	0	0
43	2.5	2.5
44	3.2	3.2
45	0	0
46	5.0	5.0
47	1.5	1.5
48	1.5	1.5
49	0	0
50	0	0
51	2.3	2.3
52	2.2	2.2
Q6701		
E	8.4	8.4

MODE PIN NO.	REC	PLAY
C	11.7	11.7
B	9.0	9.0
Q6702		
E	2.9	2.9
C	8.4	8.4
B	3.6	3.6
Q6704		
E	0	0
C	0	0
B	3.0	3.0
Q6705		
E	0	0
C	0	0
B	3.0	3.0
CN6701		
1	4.4	4.4
2	4.4	4.4
3	0	0
4	5.0	5.0
5	11.7	11.7
6	0	0
7	0	0
8	0	0
9	0	0
10	3.6	3.6
11	4.1	4.1

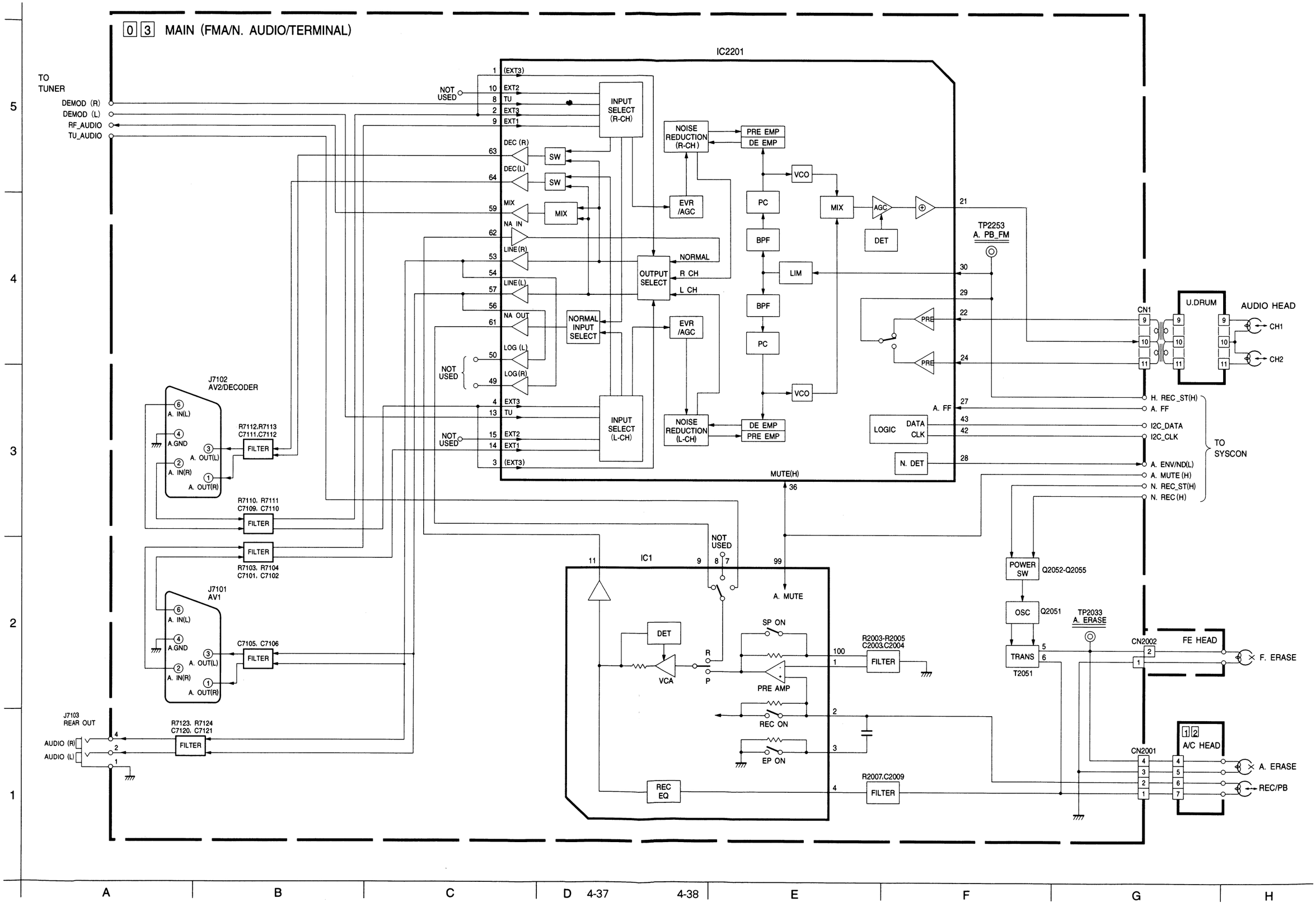
4.16 SYSTEM CONTROL BLOCK DIAGRAM



4.17 VIDEO BLOCK DIAGRAM



4.18 AUDIO BLOCK DIAGRAM



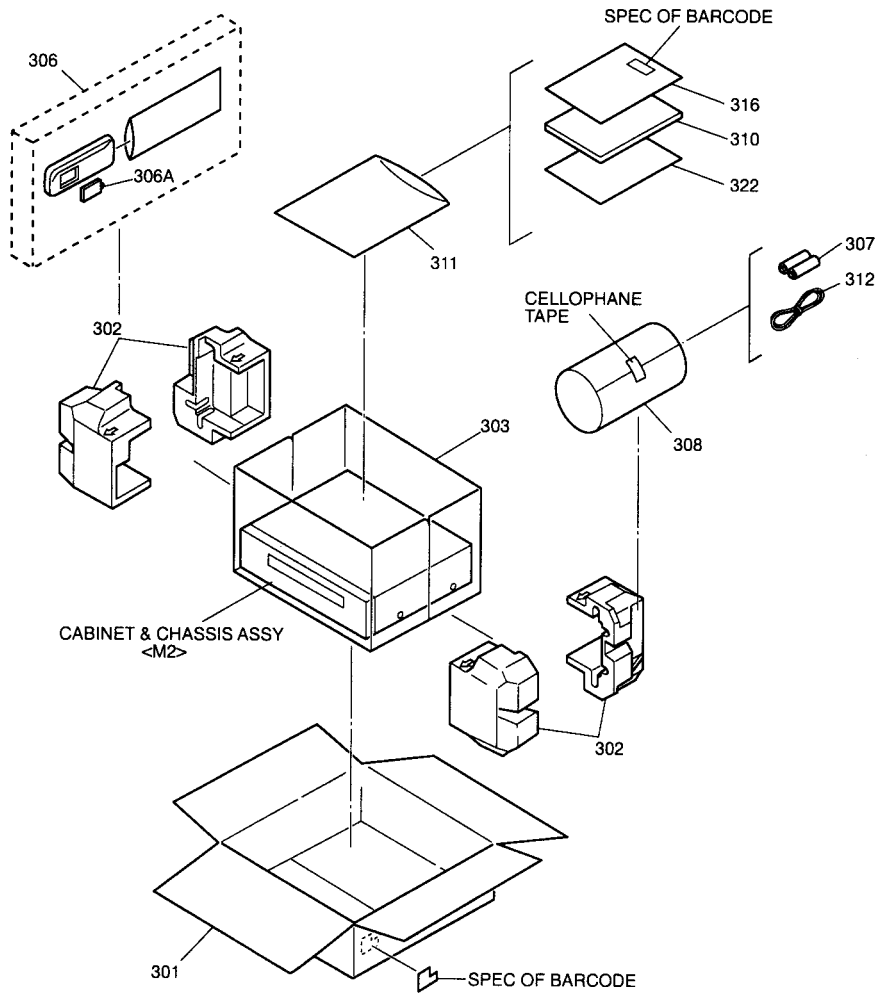
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

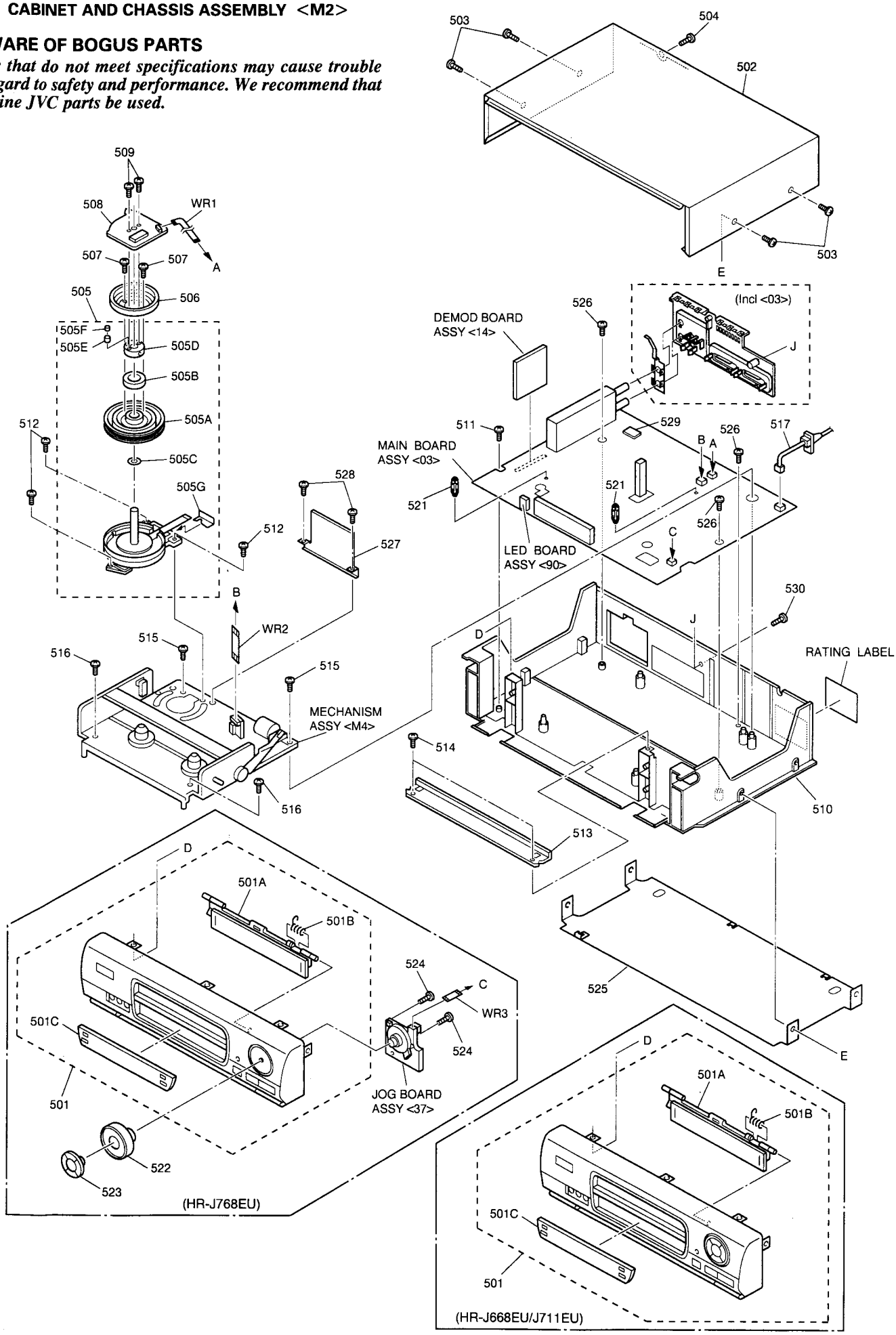
PACKING AND ACCESSORY ASSEMBLY <M1>

	301	LP30537-023A	PACKING CASE,J711EU
		LP30537-025A	PACKING CASE,J768EU
		LP30537-035A	PACKING CASE,J668EU
	302	LP30355-001D	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	306	LP20337-013A	REMOTE CONTROLLER
	306A	LP40254-004A	COVER(BATTERY)
	307	-	BATTERY,X2 (R6P TYPE)
	308	QPC02202215P	POLY BAG
⚠	310	LPT0198-001A	INST BOOK(EN),J668EU/J711EU
⚠		LPT0198-002A	INST BOOK(GE),J668EU/J711EU
⚠		LPT0198-003A	INST BOOK(FR),J668EU/J711EU
⚠		LPT0198-004A	INST BOOK(DU),J668EU/J711EU
⚠		LPT0198-006A	INST BOOK(IT),J668EU/J711EU
⚠		LPT0198-007A	INST BOOK(DA),J668EU/J711EU
⚠		LPT0198-008A	INST BOOK(FI),J668EU/J711EU
⚠		LPT0198-009A	INST BOOK(SW),J668EU/J711EU
⚠		LPT0198-010A	INST BOOK(NO),J668EU/J711EU
⚠		LPT0198-011A	INST BOOK(PT),J668EU/J711EU
⚠		LPT0198-012A	INST BOOK(GR),J668EU/J711EU
⚠		LPT0198-013A	INST BOOK(CZ),J668EU/J711EU
⚠		LPT0198-014A	INST BOOK(PO),J668EU/J711EU
⚠		LPT0198-015A	INST BOOK(HU),J668EU/J711EU
⚠		LPT0198-005A	INST BOOK(SP),J668EU/J711EU
⚠		LPT0199-001A	INST BOOK(EN),J768EU
⚠		LPT0199-002A	INST BOOK(GE),J768EU
⚠		LPT0199-003A	INST BOOK(FR),J768EU
⚠		LPT0199-004A	INST BOOK(DU),J768EU
⚠		LPT0199-005A	INST BOOK(SP),J768EU
⚠		LPT0199-006A	INST BOOK(IT),J768EU
⚠		LPT0199-007A	INST BOOK(DA),J768EU
⚠		LPT0199-008A	INST BOOK(FI),J768EU
⚠		LPT0199-009A	INST BOOK(SW),J768EU
⚠		LPT0199-010A	INST BOOK(NO),J768EU
⚠		LPT0199-011A	INST BOOK(PT),J768EU
⚠		LPT0199-012A	INST BOOK(GR),J768EU
⚠		LPT0199-013A	INST BOOK(CZ),J768EU
⚠		LPT0199-014A	INST BOOK(PO),J768EU
⚠		LPT0199-015A	INST BOOK(HU),J768EU
	311	QPC02503515P	POLY BAG
	312	PEAC0300-02	RF CABLE
	316	BT-54013-1	WARRANTY CARD
	322	PQ45146-150	SHEET(SPAIN),J711EU
		PQ45146-152	SHEET(SPAIN),J768EU
		PQ45146-162	SHEET(SPAIN),J668EU

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



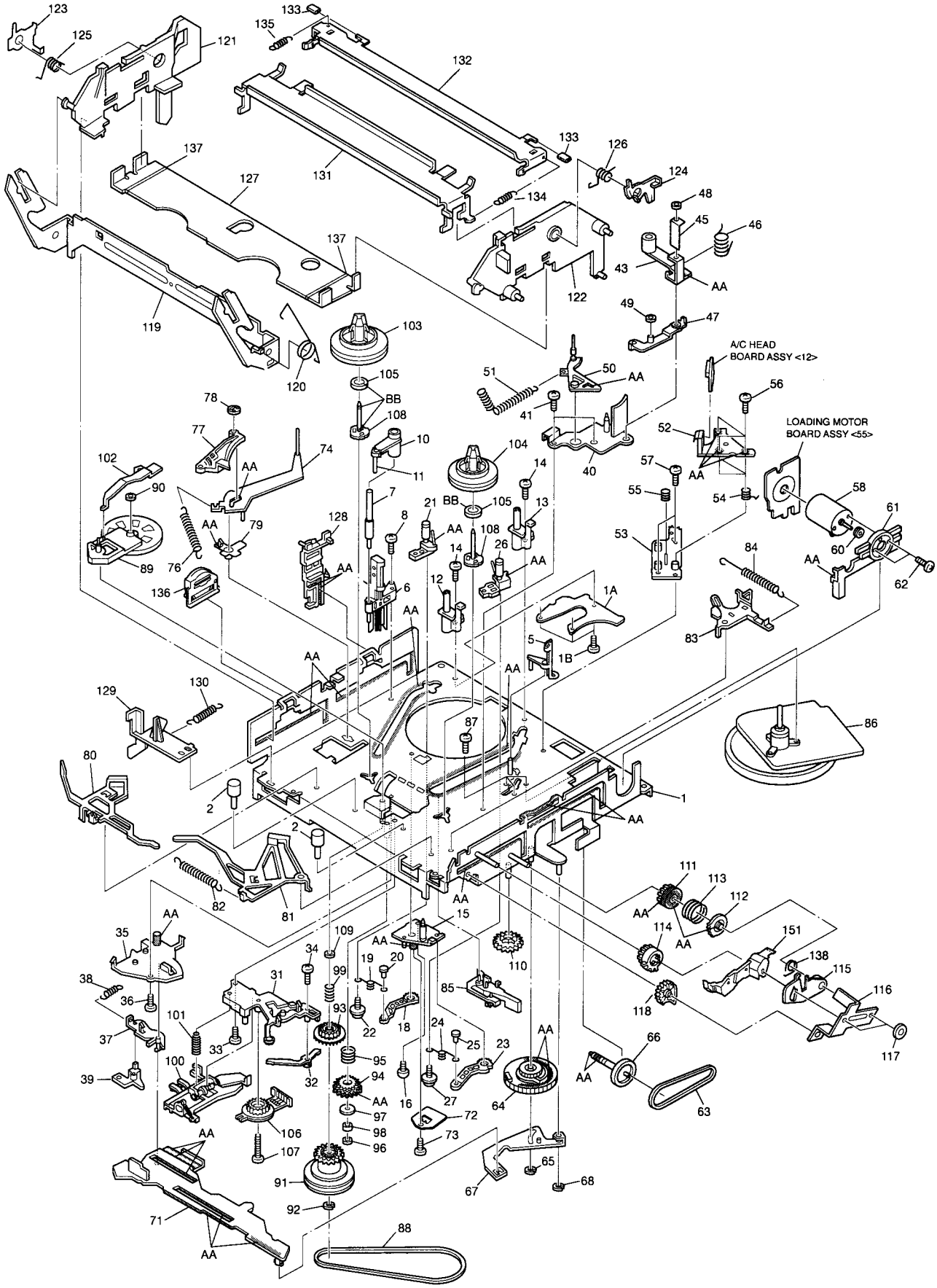
#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	⚠	501	LP10119-047C	FRONT PANEL ASSY,J668EU
	⚠		LP10212-017B	FRONT PANEL ASSY,J711EU
	⚠		LP10212-018B	FRONT PANEL ASSY,J768EU
		501A	PQ21884-128	CASSETTE DOOR,J711EU/J768EU
			PQ21884-129-23	CASSETTE DOOR,J668EU
		501B	PQ46448	TORSION SPRING
		501C	LP20326-049A	DISPLAY WINDOW,J711EU
			LP20326-050A	DISPLAY WINDOW,J768EU
			LP20326-055A	DISPLAY WINDOW,J668EU
	⚠	502	LP10013-017B	TOP COVER,J711EU/J768EU
	⚠		LP10013-023B	TOP COVER,J668EU
		503	QYTDSF3010M	SCREW,X4 TOP COVER(SIDE)
		504	QYTDSF3010M	SCREW,TOP COVER(REAR)
		505	LP20617-002A	DRUM SUB ASSY
		505A	LP20616-002A	UPPER DRUM ASSY
		505B	PDM4439	CAP
		505C	PDM4444-19-2	WASHER
		505D	LP40028-002A	COLLAR ASSY
		505E	LP40323-001A	CONTACT
		505F	LP30004-005A	COMPRESSION SPRING
		505G	LP40174-001B	FPC PLATE
		506	PDZ0179-1-4	ROTOR ASSY
		507	QYSPSP3006Z	SCREW,X2
		508	PDZ0180-1-2	STATOR ASSY
		509	QYSPSPL2607Z	SCREW,X2
	⚠	510	LP10108-001B	BOTTOM CHASSIS
		511	QYTDSF3010Z	SCREW,MAIN
		512	QYSDST2610Z	SCREW,X3 DRUM
		513	LP30312-001B	BRACKET(CHASSIS)
		514	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
		515	QYTDSF4012Z	SCREW,X2 MECHA
		516	QYTDSF3010Z	SCREW,X2 MECHA
	⚠	517	QMP4A10-170	POWER CORD
		521	LP40226-001A	PC SUPPORT,X2
		522	LP30120-008A	KNOB SHUTTLE,J768EU
		523	LP30121-008A	KNOB JOG,J768EU
		524	QYTDSF2608Z	SCREW,X2 JOG,J768EU
	⚠	525	LP10014-002B	BOTTOM COVER
		526	DPSF3010Z	SCREW,X3 MAIN
		527	LP30356-001B	DRUM SHIELD
		528	QYTDST2606Z	SCREW,X2 DRUM SHIELD
		529	LP30002-042A	SPACER,MAIN BOARD
		530	QYTDSF3010M	SCREW,TERMINAL
		WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3001
		WR2	WJT0005-002A	E-CARD WIRE,A/C HEAD CN2001
		WR3	QUQ112-0614CG	FFC WIRE,JOG CN7004,J768EU

5.3 MECHANISM ASSEMBLY <M4>



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

MECHANISM ASSEMBLY <M4>

		1	LP20228-008F	MAIN DECK ASSY
		1A	LP40275-002A	PLATE(SUPPLY)
		1B	QYTDST2606Z	SCREW,X3 PLATE(SUPPLY)
		2	PQ46302-1-3	ADJUST PIN,X2
		5	LP30492-002A	GUIDE POLE GUARD
		6	NAH0001-001	FULL ERASE HEAD
		7	LP40098-001B	GUIDE POLE(SUPPLY)
		8	QYTDST2608Z	SCREW,FE HEAD
		10	LP30459-001A	TENSION STUD BASE
		11	LP40367-002A	TENSION STUD
		12	LP40096-001B	UV CATCHER(SUPPLY)
		13	LP40536-001A	UV CATCHER ASSY(TAKE UP)
		14	QYTPST2606Z	SCREW,X2 UV CATCHER
		15	LP30223-003C	LOADING ARM GEAR SHAFT
		16	QYTDST2606Z	SCREW
		18	LP30224-001A	LOADING ARM GEAR(SPPLY)
		19	LP40099-001A	TORSION ARM
		20	LP40100-001A	PIN
		21	LP40101-002A	POLE BASE ASSY(SUPPLY)
		22	QYSPSTG2606Z	SCREW
		23	LP40103-002A	LOADING ARM GEAR(TAKE UP)
		24	LP40523-001A	TORSION ARM
		25	LP40100-001A	PIN
		26	LP40104-002A	POLE BASE ASSY(TAKE UP)
		27	QYSPSTG2606Z	SCREW
		31	LP20233-003H	ROTARY ENCODER GUIDE
		32	LP30499-001A	BRAKE LEVER
		33	QYTPST2606Z	SCREW
		34	QYTPST2608Z	SCREW
		35	LP30226-004B	CONTROL PLATE GUIDE
		36	QYTPST2605Z	SCREW
		37	LP30249-003B	TAKE UP LEVER
		38	LP30003-006A	TENSION SPRING
		39	LP40119-002A	T.UP HEAD
		40	LP20234-004B	LID GUIDE
		41	QYTDST2606Z	SCREW,X2
		43	LP40105-001B	PINCH ROLLER ARM ASSY
		45	LP40478-001A	PINCH ROLLER SHEET2
		46	LP40148-002A	TORSION SPRING
		47	LP40149-001B	P.LEVER ASSY
		48	LP30016-002A	SLIT WASHER
		49	LP40404-001A	SPACER,P.LEVER ASSY
		50	LP40106-001G	GUIDE ARM ASSY
		51	LP40134-001B	TENSION SPRING
		52	QAH0010-004	AC HEAD
		53	LP30228-001A	HEAD BASE
		54	LP30004-013A	COMPRESSION SPRING,X3
		55	LP40236-001A	COMPRESSION SPRING
		56	LP40213-002B	SPECIAL SCREW,X3
		57	QYTDST2608Z	SCREW,X2
		58	QAR0023-001	LOADING MOTOR
		60	PQ43546-1-2	MOTOR PULLEY
		61	LP30230-003A	MOTOR GUIDE
		62	QYTPSP3003Z	SCREW,X2
		63	LP30005-003A	BELT,LOADING MOTOR
		64	LP30229-001F	CONTROL CAM
		65	PQM30017-24	SLIT WASHER
		66	LP40120-001A	WORM GEAR
		67	LP40107-002A	LINK LEVER ASSY
		68	PQM30017-24	SLIT WASHER
		71	LP10201-001A	CONTROL PLATE
		72	LP40379-001A	CTL BRACKET(1)
		73	QYTDSF2608M	SCREW
		74	LP40108-002A	TENSION ARM ASSY
		76	LP30003-010A	TENSION SPRING
		77	LP40109-002D	TENSION BRAKE ASSY
		78	PQ46302-1-3	ADJUST PIN
		79	LP30232-002A	T.ARM BEARING
		80	LP40532-001A	MAIN BRAKE ASSY (SUPPLY)
		81	LP40111-003A	MAIN BRAKE ASSY (TAKE-UP)
		82	LP30003-002A	TENSION SPRING
		83	LP40112-001E	SUB BRAKE ASSY(TAKE UP)
		84	LP40357-002A	TENSION SPRING
		85	LP40461-001A	CAPSTAN BRAKE ASSY
		86	QAR0087-002	CAPSTAN MOTOR
		87	QYTDSF2608M	SCREW,X3
		88	LP30005-007A	BELT,CAPSTAN MOTOR
		89	LP40114-006B	IDLER ARM ASSY
		90	LP30016-001A	SLIT WASHER
		91	LP40459-003B	CLUTCH UNIT
		92	PQM30017-47	SLIT WASHER
		93	LP40446-002A	CLUTCH GEAR 1
		94	LP40442-001A	DIRECT GEAR
		95	LP40483-002A	COMPRESSION SPRING
		96	LP30016-001A	SLIT WASHER
		97	LP30017-014A	SPACER,D.GEAR
		98	QYWFM264713	WASHER,D.GEAR
		99	LP40554-001A	COMPRESSION SPRING,C.GEAR 1
		100	LP40484-001E	CHANGE LEVER ASSY
		101	LP40512-003A	COMPRESSION SPRING
		102	LP30236-002B	IDLER LEVER
		103	LP40420-001A	REEL DISK (SUPPLY)
		104	LP40421-001A	REEL DISK (TAKE-UP)
		105	LP30017-015A	SPACER,X2
		106	QSW0554-003	ROTARY ENCODER
		107	QYTPST2620Z	SCREW
		108	LP40123-001A	REEL SHAFT,X2
		109	LP30017-019A	SPACER,C.GEAR 1
		110	LP30237-002B	CASSETTE GEAR
		111	LP30239-002F	LIMIT GEAR(1)
		112	LP30240-002G	LIMIT GEAR(2)
		113	LP40136-001E	TORSION SPRING
		114	LP30242-001A	RELAY GEAR
		115	LP30339-002D	OPENER GUIDE
		116	LP40214-001A	C.H.BRACKET
		117	PQM30017-47	SLIT WASHER,X2
		118	LP30243-001C	DRIVE GEAR
		119	LP20240-001C	DRIVE ARM
		120	LP40137-001A	TORSION SPRING
		121	LP10081-001G	SIDE HOLDER(L)
		122	LP10082-002K	SIDE HOLDER(R)
		123	LP30255-003C	LOCK LEVER(L)
		124	LP30256-001E	LOCK LEVER(R)
		125	LP40168-001A	TORSION SPRING(L)
		126	LP40218-001B	TORSION SPRING(R)
		127	LP30257-001E	CASSETTE HOLDER
		128	LP30244-001F	GUIDE RAIL
		129	LP30245-001C	REC SAFETY LEVER
		130	LP30003-004A	TENSION SPRING
		131	LP20578-001B	TOP GUIDE
		132	LP30500-001C	HOLD PLATE
		133	LP40450-002A	PAD,X2 HOLD PLATE
		134	LP30003-025B	TENSION SPRING
		135	LP30003-024A	TENSION SPRING
		136	LP40481-001A	ROLLER CAM ASSY
		137	LP30019-014A	PAD,X2 CASSETTE HOLDER
		138	LP40545-001A	TORSION SPRING,OPENER GUIDE
		151	LP20324-002E	DOOR OPENER

5.4 ELECTRICAL PARTS LIST

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
**********				

MAIN BOARD ASSEMBLY <03>

		PW1	LPA10045-05E1	MAIN BOARD ASSY,J668EU/J711EU
			LPA10045-07E1	MAIN BOARD ASSY,J768EU
		IC1	JCP8017-MSA	IC
		IC201	LC74775-9750	IC
		IC2201	AN3650NFBP	IC
		IC3001	HD6432194A27F	IC
		IC3002	S-80728AN-DR-X	IC
			or S-80828ANUP-W	IC
		IC3003	M24C08-BN6	IC
			or S-24C08ADP	IC
			or AT24C08-10PC	IC
			or 24LC08B/P	IC
		IC3004	TA7291S	IC
		IC5301	LA5613	IC
		IC6080	BA15218F-XE	IC
		IC7001	M35500BGP	IC
			or M35500AGP	IC
		IC7002	GP1U291Q	IR DETECT UNIT
			or PNA4652M00YC	IR DETECT UNIT
		IC7151	BH7635S	IC
		Q34	2SC4081/S/-X	TRANSISTOR
		Q35	2SC4081/S/-X	TRANSISTOR
		Q36	2SC4081/S/-X	TRANSISTOR
		Q37	2SC4081/S/-X	TRANSISTOR
		Q38	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q39	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q152	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2001	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2002	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2003	UN511E	TRANSISTOR
			or RN2309	TRANSISTOR
			or DTA144WU	TRANSISTOR
		Q2051	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2052	2SA1576A/QR/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2053	UN521E	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
		Q2054	2SA1576A/QR/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2055	UN521E	TRANSISTOR
			or DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
		Q2151	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2152	UN511E	TRANSISTOR
			or DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
		Q2253	DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
			or UN5211	TRANSISTOR
		Q3001	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q3002	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV16A	PHOTO TRANSISTOR
		Q3003	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV16A	PHOTO TRANSISTOR
		Q3004	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q3005	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3006	UN521K	TRANSISTOR
			or DTC114WU	TRANSISTOR
		Q3008	UN521E	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
		Q4001	UN5211	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
		Q5101	2SK2632-CB14	POWER MOS FET
			or 2SK2129	POWER MOS FET
			or 2SK2129-LT	POWER MOS FET
			or 2SK2632	POWER MOS FET
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q5303	2SD2144S/UVW/-T	TRANSISTOR
		Q5304	2SD1450/ST/-T	TRANSISTOR
			or 2SD1302/ST/-T	TRANSISTOR
		Q5305	UN5111	TRANSISTOR
			or RN2302	TRANSISTOR
			or DTA114EU	TRANSISTOR
		Q5306	2SB1256	TRANSISTOR
		Q5310	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q5311	2SA1576A/RS/-X	TRANSISTOR
			or 2SB1218A/RS/-X	TRANSISTOR
		Q5312	2SA1745/6-7/-X	TRANSISTOR
		Q6030	2SB1218A/RS/-X	TRANSISTOR
		Q6031	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q6032	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q7152	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q7153	UN511E	TRANSISTOR
			or RN2309	TRANSISTOR
			or DTA144WU	TRANSISTOR

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		Q7154	UN521E	TRANSISTOR
			or DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
		Q7155	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q7156	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		D2001	1SS133	DIODE
		D2201	11ES2	DIODE
		D2251	RB721Q-40-T2	DIODE
		D3001	LNB2301L01VI	LE DIODE
		D3002	1SS133	DIODE
		D3003	RD39ES/B3/-T2	ZENER DIODE
			or MTZJ39C	ZENER DIODE
		D3004	11ES2	DIODE
		D3005	11ES2	DIODE
		D3008	1SS133	DIODE
		D4001	1SS133	DIODE
		D4002	1SS133	DIODE
		D5001	S1WB(A)60F4102	BRIDGE DIODE
			or S1WB(A)60F4072X	BRIDGE DIODE
			or S1WB(A)60F4062X	BRIDGE DIODE
		D5101	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS4	FR DIODE
		D5102	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS4	FR DIODE
		D5103	1SS133	DIODE
		D5105	1SS133	DIODE
		D5201	AU01Z	FR DIODE
			or 10ELS2	FR DIODE
		D5203	AU01Z	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS2	FR DIODE
			or ERA18-02-T2	FR DIODE
		D5204	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS2	FR DIODE
			or PG104RS	FR DIODE
		D5205	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or 10ELS2	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5210	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS2	FR DIODE
		D5211	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS2	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5212	21DQ04	BARRIER DIODE
			or RK14LF-B2	BARRIER DIODE
		D5301	MTZJ15A	ZENER DIODE
			or RD15ES/B1/-T2	ZENER DIODE
		D5302	MTZJ6.8A	ZENER DIODE
			or RD6.8ES/B1/-T2	ZENER DIODE
		D5303	MTZJ30A	ZENER DIODE
			or RD30ES/B1/-T2	ZENER DIODE
		D5304	1SS133	DIODE
		D5307	1SS133	DIODE
		D5308	1SS133	DIODE
		D5309	1SS133	DIODE
		D5311	RD5.1ES/B3/-T2	ZENER DIODE
			or MTZJ5.1C	ZENER DIODE
		D6002	HZ30-2L-T2	ZENER DIODE
			or HZ30-2LTD	Z DIODE (M)
		D7002	RD9.1ES/B2/-T2	ZENER DIODE
			or MTZJ9.1B	ZENER DIODE
		D7008	1SS133	DIODE
		D7009	1SS133	DIODE
		D7010	1SS133	DIODE
		D7101	1SS133	DIODE
		D7102	1SS133	DIODE
		R1	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R2	NRSA02J-561X	MG RESISTOR 560Ω,1/10W
		R3	NRSA02J-273X	MG RESISTOR 27kΩ,1/10W
		R7	NRSA02J-472X	MG RESISTOR 4.7kΩ,1/10W
		R23	NRSA02J-822X	MG RESISTOR 8.2kΩ,1/10W
		R24	NRSA02J-682X	MG RESISTOR 6.8kΩ,1/10W
		R25	NRSA02J-152X	MG RESISTOR 1.5kΩ,1/10W
		R63	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
		R120	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
		R121	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
		R122	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R123	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
		R124	NRSA02J-681X	MG RESISTOR 680Ω,1/10W
		R131	QRE141J-0R0Y	RESISTOR 0Ω,1/4W
		R155	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
		R190	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R202	NRSA02J-103X	MG RESISTOR 10kΩ,1/10W
		R209	NRSA02J-512X	MG RESISTOR 5.1kΩ,1/10W
		R210	NRSA02J-182X	MG RESISTOR 1.8kΩ,1/10W
		R211	NRSA02J-562X	MG RESISTOR 5.6kΩ,1/10W
		R213	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R214	QRE141J-0R0Y	RESISTOR 0Ω,1/4W
		R216	NRSA02J-103X	MG RESISTOR 10kΩ,1/10W
		R218	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R2001	NRSA02J-103X	MG RESISTOR 10kΩ,1/10W
		R2002	QRE141J-103Y	RESISTOR 10kΩ,1/4W
		R2003	NRSA02J-682X	MG RESISTOR 6.8kΩ,1/10W
		R2004	NRSA02J-224X	MG RESISTOR 220kΩ,1/10W
		R2005	NRSA02J-181X	MG RESISTOR 180Ω,1/10W
		R2006	NRSA02J-273X	MG RESISTOR 27kΩ,1/10W
		R2007	NRSA02J-183X	MG RESISTOR 18kΩ,1/10W
		R2009	NRSA02J-101X	MG RESISTOR 100Ω,1/10W
		R2013	NRSA02J-332X	MG RESISTOR 3.3kΩ,1/10W
		R2014	NRSA02J-153X	MG RESISTOR 15kΩ,1/10W
		R2016	NRSA02J-0R0X	MG RESISTOR 0Ω,1/10W
		R2018	NRSA02J-472X	MG RESISTOR 4.7kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	NRSA02J-820X	MG RESISTOR	82Ω,1/10W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2151	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2152	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2201	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2202	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2203	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2204	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2206	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2207	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2209	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2210	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2212	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R2213	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2215	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R2216	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2218	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2219	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2220	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2221	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2222	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2223	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2224	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2225	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2226	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2227	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R2228	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2229	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2230	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2231	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2236	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2237	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2239	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2240	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2251	NRVA02D-303X	MG RESISTOR	30kΩ,1/10W
		R2252	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2254	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3011	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3013	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3014	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3015	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3020	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3021	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3022	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3025	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3029	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3031	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3036	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3037	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3038	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3039	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3040	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3041	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3042	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3044	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3046	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3047	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3048	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3049	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3050	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3051	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3052	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3053	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3054	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3055	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3056	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3057	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3061	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3062	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3066	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3069	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3071	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3072	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3073	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3074	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3075	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3076	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3080	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3081	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3083	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3085	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3086	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3087	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3088	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R3091	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3092	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3093	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3097	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3098	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3105	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R3205	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3206	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3207	QRE141J-183Y	RESISTOR	18kΩ,1/4W
		R3208	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3209	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3210	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3211	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3212	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
		R3213	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R3214	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3215	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3217	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R3218	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3219	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R3220	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3223	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3224	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3225	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R3229	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3230	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3231	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3232	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R3234	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3235	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3236	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R4001	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R4003	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4004	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4005	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R4007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4008	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4010	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4011	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R4012	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4013	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R4014	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4015	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		R4016	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4019	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4020	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R5101	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5102	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG029J-154G	OMF RESISTOR	150kΩ,2W
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
		R5108	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5111	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
		R5112	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	⚠	R5304	QRZ9005-221X	FUSI RESISTOR	220Ω,1/4W
		R5305	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R5307	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5310	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R5311	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R5312	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R5313	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R5314	QRE141J-222Y	RESISTOR	2.2kΩ,1/4W
		R5317	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R5318	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R5319	QRE141J-511Y	RESISTOR	510Ω,1/4W
		R5320	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5321	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R5322	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R5323	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R5324	QRE141J-102Y	RESISTOR	1kΩ,1/4W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R5326	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6020	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6021	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6022	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6031	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R6032	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R6033	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R6050	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R6051	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6052	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6082	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7001	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7002	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7003	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7004	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7005	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7006	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7008	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7009	QRE141J-153Y	RESISTOR,J768EU	15kΩ,1/4W
		R7013	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7014	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7016	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7017	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	QRE141J-182Y	RESISTOR	1.8kΩ,1/4W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7026	QRE141J-682Y	RESISTOR	6.8kΩ,1/4W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
		R7040	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7041	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7042	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7101	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7102	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7103	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7104	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7105	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7106	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7108	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7109	QRE141J-750Y	RESISTOR	75Ω,1/4W
		R7110	NQL092M-4R7X	COIL	4.7μH
		R7111	NQL092M-4R7X	COIL	4.7μH
		R7112	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7113	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7123	NQL092M-4R7X	COIL	4.7μH
		R7124	NQL092M-4R7X	COIL	4.7μH
		R7152	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7153	QRE141J-471Y	RESISTOR	470Ω,1/4W

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R7155	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
R7160	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
R7161	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
R7162	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
R7163	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
R7164	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
R7165	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
C1	QEKJ1CM-106	E CAPACITOR	10μF,16V
C3	NCB21HK-103X	CAPACITOR	0.01μF,50V
C5	NCB21HK-103X	CAPACITOR	0.01μF,50V
C7	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
C9	NCB21HK-103X	CAPACITOR	0.01μF,50V
C11	NCB21HK-103X	CAPACITOR	0.01μF,50V
C12	NCB21CK-473X	CAPACITOR	0.047μF,16V
C13	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
C14	NCB21EK-333X	CAPACITOR	0.033μF,25V
C16	NCF21CZ-105X	CAPACITOR	1μF,16V
C20	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
C21	NCB21EK-104X	CAPACITOR	0.1μF,25V
C23	NCB21EK-223X	CAPACITOR	0.022μF,25V
C24	NCB21CK-474X	CAPACITOR	0.47μF,16V
C25	NCB21CK-224X	CAPACITOR	0.22μF,16V
C29	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C30	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C31	NCB21EK-223X	CAPACITOR	0.022μF,25V
C32	NCB21HK-103X	CAPACITOR	0.01μF,50V
C34	QCC11EK-104	CAPACITOR	0.1μF,25V
C37	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C40	NCB21HK-103X	CAPACITOR	0.01μF,50V
C41	NCB21EK-104X	CAPACITOR	0.1μF,25V
C42	NCB21EK-103X	CAPACITOR	0.01μF,25V
C43	NCF21HZ-103X	CAPACITOR	0.01μF,50V
C45	NCB21EK-104X	CAPACITOR	0.1μF,25V
C48	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C49	NDC21HJ-331X	CAPACITOR	330pF,50V
C51	QEQF1HM-225	NP E CAPACITOR	2.2μF,50V
C54	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
C55	QERF1CM-106	E CAPACITOR	10μF,16V
C56	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
C57	NCB21EK-104X	CAPACITOR	0.1μF,25V
C58	NCB21EK-104X	CAPACITOR	0.1μF,25V
C59	NCB21EK-104X	CAPACITOR	0.1μF,25V
C60	NCB21EK-104X	CAPACITOR	0.1μF,25V
C61	NDC21HJ-330X	CAPACITOR	33pF,50V
C62	NCB21EK-104X	CAPACITOR	0.1μF,25V
C63	NDC21HJ-151X	CAPACITOR	150pF,50V
C64	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C65	NCB21EK-104X	CAPACITOR	0.1μF,25V
C81	NDC21HJ-150X	CAPACITOR	15pF,50V
C82	NDC21HJ-150X	CAPACITOR	15pF,50V
C83	NDC21HJ-150X	CAPACITOR	15pF,50V
C84	NDC21HJ-150X	CAPACITOR	15pF,50V
C85	NCB21EK-104X	CAPACITOR	0.1μF,25V
C104	NDC21HJ-330X	CAPACITOR	33pF,50V
C107	NDC21HJ-5R0X	CAPACITOR	5pF,50V
C108	NCB21EK-104X	CAPACITOR	0.1μF,25V
C121	NCB21HK-103X	CAPACITOR	0.01μF,50V
C134	NCB21EK-104X	CAPACITOR	0.1μF,25V
C135	NCB21EK-104X	CAPACITOR	0.1μF,25V
C136	NCB11EK-104X	CAPACITOR	0.1μF,25V
C152	NCB21HK-103X	CAPACITOR	0.01μF,50V

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C164	NDC21HJ-221X	CAPACITOR	220pF,50V
C165	NDC21HJ-221X	CAPACITOR	220pF,50V
C204	NDC21HJ-100X	CAPACITOR	10pF,50V
C206	NDC21HJ-330X	CAPACITOR	33pF,50V
C207	NDC21HJ-330X	CAPACITOR	33pF,50V
C209	NCB21CK-474X	CAPACITOR	0.47μF,16V
C212	NCB21EK-104X	CAPACITOR	0.1μF,25V
C213	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C214	NCB21CK-224X	CAPACITOR	0.22μF,16V
C215	NCB21CK-224X	CAPACITOR	0.22μF,16V
C216	QERF0JM-107	E CAPACITOR	100μF,6.3V
C217	NDC21HJ-560X	CAPACITOR	56pF,50V
C218	QERF1HM-105	E CAPACITOR	1μF,50V
C222	QERF1HM-105	E CAPACITOR	1μF,50V
C225	QERF0JM-107	E CAPACITOR	100μF,6.3V
C226	QERF0JM-107	E CAPACITOR	100μF,6.3V
C2002	QEKJ1CM-476	E CAPACITOR	47μF,16V
C2003	NCB21HK-123X	CAPACITOR	0.012μF,50V
C2004	QEKJ1CM-226	E CAPACITOR	22μF,16V
C2005	NCB21HK-102X	CAPACITOR	0.001μF,50V
C2006	NCB21HK-331X	CAPACITOR	330pF,50V
C2007	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2008	NCB21HK-152X	CAPACITOR	0.0015μF,50V
C2009	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C2010	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C2011	NCB21EK-333X	CAPACITOR	0.033μF,25V
C2013	NCB21EK-333X	CAPACITOR	0.033μF,25V
C2015	QEKJ1CM-226	E CAPACITOR	22μF,16V
C2016	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C2051	NCB21HK-331X	CAPACITOR	330pF,50V
C2052	QFLC1HJ-823Z	F CAPACITOR	0.082μF,50V
C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
C2054	NCB21HK-223X	CAPACITOR	0.022μF,50V
C2055	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2151	NCB21HK-103X	CAPACITOR	0.01μF,50V
C2152	NCB21HK-103X	CAPACITOR	0.01μF,50V
C2201	QEKJ1HM-105	E CAPACITOR	1μF,50V
C2202	QEKJ1HM-105	E CAPACITOR	1μF,50V
C2204	QEKJ1CM-226	E CAPACITOR	22μF,16V
C2205	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C2206	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
C2207	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C2208	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2209	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2210	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2211	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2212	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C2213	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
C2214	NCB21HK-103X	CAPACITOR	0.01μF,50V
C2215	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2218	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2219	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2220	QEKJ1CM-476	E CAPACITOR	47μF,16V
C2221	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2222	QEKJ1CM-226	E CAPACITOR	22μF,16V
C2225	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
C2226	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2227	QEKJ1CM-106	E CAPACITOR	10μF,16V
C2230	NCB21CK-473X	CAPACITOR	0.047μF,16V
C2231	NCB21HK-153X	CAPACITOR	0.015μF,50V
C2232	QEKJ1HM-224	E CAPACITOR	0.22μF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C2233	NCB21HK-153X	CAPACITOR	0.015μF,50V
		C2234	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C2251	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C2252	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C2253	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C2257	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2258	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C2259	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C2260	NDC21HJ-181X	CAPACITOR	180pF,50V
		C2261	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3002	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3003	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C3004	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3011	QETL0JM-338	E CAPACITOR	3300μF,6.3V
		C3012	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
		C3013	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3014	QERF1CM-476	E CAPACITOR	47μF,16V
		C3016	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3019	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3020	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3021	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3022	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3023	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3024	NDC21HJ-220X	CAPACITOR	22pF,50V
		C3025	QAT7001-300Z	TRIM CAPACITOR,TIMER CLOCK	
		C3026	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3027	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3028	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3029	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3030	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C3031	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3032	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3033	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3036	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3037	NDC21HJ-120X	CAPACITOR	12pF,50V
		C3038	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3039	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3040	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C4001	QERF1CM-476	E CAPACITOR	47μF,16V
		C4002	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C4003	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4004	QERF1CM-226	E CAPACITOR	22μF,16V
		C4005	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C4006	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C4008	QEQF1HM-105	NP E CAPACITOR	1μF,50V
		C4009	NCB21HK-563X	CAPACITOR	0.056μF,50V
		C4010	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C4011	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C4012	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
		C4013	NCB21HK-563X	CAPACITOR	0.056μF,50V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4015	NCB21HJ-102X	CAPACITOR	0.001μF,50V
		C4016	QCBB1HJ-101	CAPACITOR	100pF,50V
	⚠	C5001	QFZ9051-683	F CAPACITOR	0.068μF,250V
	⚠	C5002	QFZ9051-333	F CAPACITOR	0.033μF,250V
	⚠	C5005	QCZ9071-222	CAPACITOR	0.0022μF,250V
		C5006	QEZ0374-686	E CAPACITOR	68μF,400V
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0302-330Z	CAPACITOR	33pF,1kV
		C5104	QETC1HM-105	E CAPACITOR	1μF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
		C5106	QCBB1HJ-271	CAPACITOR	270pF,50V
		C5107	QFV11HJ-104	F CAPACITOR	0.1μF,50V
		C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
		C5203	QEMT1AM-108	E CAPACITOR	1000μF,10V
		C5204	QETN2AM-475	E CAPACITOR	4.7μF,100V
		C5205	QETC1HM-106	E CAPACITOR	10μF,50V
		C5207	QETN1CM-227	E CAPACITOR	220μF,16V
		C5208	QETN1AM-227	E CAPACITOR	220μF,10V
		C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5302	QETC1HM-106	E CAPACITOR	10μF,50V
		C5303	QETN1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5305	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C5306	QETN1AM-107	E CAPACITOR	100μF,10V
		C5307	QETN1CM-226	E CAPACITOR	22μF,16V
		C5308	QEKC1CM-476	E CAPACITOR	47μF,16V
		C5309	QETN1CM-107	E CAPACITOR	100μF,16V
		C6006	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6008	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6012	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C6013	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6014	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6016	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6020	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6021	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6022	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6032	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C6037	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6055	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7002	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7010	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7011	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7020	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7021	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7101	NCB21HK-681X	CAPACITOR	680pF,50V
		C7102	NCB21HK-681X	CAPACITOR	680pF,50V
		C7103	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7104	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7109	NCB21HK-681X	CAPACITOR	680pF,50V
		C7110	NCB21HK-681X	CAPACITOR	680pF,50V
		C7111	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7112	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7120	NCB21HK-681X	CAPACITOR	680pF,50V
		C7121	NCB21HK-681X	CAPACITOR	680pF,50V
		C7151	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7152	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7153	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7154	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7155	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7156	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C7166	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7167	NDC21HJ-680X	CAPACITOR	68pF,50V
		C7169	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7171	NCB21EK-104X	CAPACITOR	0.1μF,25V
		L1	QQL29BJ-100Z	COIL	10μH
		L4	QQL29BJ-100Z	COIL	10μH
		L7	QQL29BK-R22Z	COIL	0.22μH

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		L8	QQL29BJ-101Z	COIL	100μH
		L9	QQL29BJ-100Z	COIL	10μH
		L16	QQL29BJ-100Z	COIL	10μH
		L18	QQR0967-001	COIL	12μH
		L104	QQL231J-1R0Y	COIL	1μH
		L201	QQL29BK-1R0Z	COIL	1μH
		L202	QQL231J-330Y	COIL	33μH
		L203	QQL29BJ-220Z	COIL	22μH
		L204	QQL29BJ-100Z	COIL	10μH
		L206	QQL29BJ-220Z	COIL	22μH
		L2251	QQL29BJ-100Z	COIL	10μH
		L2252	QQL29BJ-151Z	COIL	150μH
		L5201	PELN1184	COIL	33μH
		L5202	PELN1184	COIL	33μH
		L5301	QQL01BK-101Z	COIL	100μH
		L6003	QQL29BJ-100Z	COIL	10μH
		L6031	QQL29BK-1R0Z	COIL	1μH
		L7101	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		L7102	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		L7153	QQL231J-1R0Y	COIL	1μH
		L7155	QQL231J-1R0Y	COIL	1μH
		X1	QAX0530-001	CRYSTAL RESONATOR	
		X3001	QAX0445-001	CRYSTAL RESONATOR	
		X3002	QAX0527-001	CRYSTAL RESONATOR	
		S3001	QSW0602-003	PUSH SWITCH,REC SAFETY	
		S7001	QSW0456-002Z	TACT SWITCH,STAND BY	
		S7002	QSW0456-002Z	TACT SWITCH,TIMER	
		S7004	QSW0456-002Z	TACT SWITCH,CH-	
		S7006	QSW0456-002Z	TACT SWITCH,CH+	
		S7008	QSW0456-002Z	TACT SWITCH,DISPLAY,J668EU/J711EU	
			QSW0456-002Z	TACT SWITCH,PLAY,J768EU	
		S7010	QSW0456-002Z	TACT SWITCH,REC	
		S7011	QSW0456-002Z	TACT SWITCH,REW,J668EU/J711EU	
		S7012	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		S7013	QSW0456-002Z	TACT SWITCH,PLAY,J668EU/J711EU	
		S7014	QSW0456-002Z	TACT SWITCH,PAUSE	
		S7015	QSW0456-002Z	TACT SWITCH,FF,J668EU/J711EU	
		S7016	QSW0456-002Z	TACT SWITCH,ST BOX	
		K5101	QQR0678-001Z	FERRITE BEAD	
		PC3001	GP3S123	IC(PHOTO SENSOR)	
		PC3002	GP3S123	IC(PHOTO SENSOR)	
	⚠	PC5101	PC123F2	PH COUPLER	
	⚠	PC5301	PS2501-1	PH COUPLER	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0033-001	SW TRANSFORMER	
		TU6001	QAU0107-001	TUNER	
		SD1	LP30530-001B	SHIELD CASE(PRE)	
		DI7001	QLF0031-001	FL TUBE	
		HD1	PQ35479-1-4	HOLDER(FDP),DI7001	
	⚠	HS1	LP40090-001A	HEAT SINK,Q5101	
		OT1	QYTDST3006Z	SCREW,Q5101	
	⚠	TB1	LP20317-003A	TERMINAL BOARD(PAL)	
		ET1	PQ21623-2-5	EARTH PLATE(RF)	
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7101	PEMC1104	RGB21PIN SOCKET,A/V1 I/O	
		J7102	PEMC1104	RGB21PIN SOCKET,A/V2 DECODER	
		J7103	QNN0292-003	PIN JACK,REAR OUT	
	⚠	LF5001	PELN1204-01-01	LINE FILTER	
	⚠	LF5002	QQR0608-001	LINE FILTER	
		CN1	QGF1028C1-11	FPC CONNECTOR,(1-11)U.DRUM	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGF1207C1-05	FPC CONNECTOR,(1-5)	
		CN3002	QGB2532J1-02	CONNECTOR,(1-2)L.MOTOR	
		CN3003	QGB2015M2-08	CONNECTOR,(1-8)CAP.MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)R.ENCODER	
	⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
		CN7002	QGB2530K1-03	CONNECTOR,(1-3)LED	
		CN7004	QGF1207C1-06	FPC CONNECTOR,(1-5)JOG/SHUTTLE,J768EU	
	⚠	CP3001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP4001	ICP-N15	CIRCUIT PROTECTOR	
	⚠	CP5301	ICP-N38	CIRCUIT PROTECTOR	
	⚠	F5001	QMF51E2-1R6J1	FUSE	T1.6A,AC250V

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AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

	PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
	CN1	QGF1208F1-07	FPC CONNECTOR

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DEMOD BOARD ASSEMBLY <14>

	PW1	LPA10021-03B	DEMOD BOARD ASSY
	IC6701	MSP34VCD	IC
		or MSP3415D	IC
	Q6701	2SC3068	TRANSISTOR
	Q6702	2SC3354/TS/-T	TRANSISTOR
	Q6704	DTC114EU	TRANSISTOR
		or UN5211	TRANSISTOR
	Q6705	DTC114EU	TRANSISTOR
		or UN5211	TRANSISTOR
	D6702	MTZJ9.1B	ZENER DIODE
	D6703	1N4148M	DIODE
		or 1SS133	DIODE
	D6704	1N4148M	DIODE
		or 1SS133	DIODE
	R6701	NRSA02J-101X	MG RESISTOR 100Ω,1/10W
	R6702	NRSA02J-101X	MG RESISTOR 100Ω,1/10W
	R6703	NRSA02J-271X	MG RESISTOR 270Ω,1/10W
	R6704	NRSA02J-101X	MG RESISTOR 100Ω,1/10W
	R6705	NRSA02J-472X	MG RESISTOR 4.7kΩ,1/10W
	R6706	NRSA02J-392X	MG RESISTOR 3.9kΩ,1/10W
	R6707	NRSA02J-470X	MG RESISTOR 47Ω,1/10W
	R6708	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
	R6709	NRSA02J-271X	MG RESISTOR 270Ω,1/10W
	R6710	NRSA02J-151X	MG RESISTOR 150Ω,1/10W
	R6712	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
	R6713	NRSA02J-103X	MG RESISTOR 10kΩ,1/10W
	R6714	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
	R6715	NRSA02J-223X	MG RESISTOR 22kΩ,1/10W
	R6716	NRSA02J-102X	MG RESISTOR 1kΩ,1/10W
	R6717	NRSA02J-223X	MG RESISTOR 22kΩ,1/10W
	R6718	NRSA02J-684X	MG RESISTOR 680kΩ,1/10W
	C6703	QEKJ1CM-336	E CAPACITOR 33μF,16V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C6704	QEKJ1CM-107	E CAPACITOR	100μF,16V
		C6705	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6706	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C6707	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6708	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6709	QEKJ1CM-336	E CAPACITOR	33μF,16V
		C6710	NCB21HK-682X	CAPACITOR	0.0068μF,50V
		C6711	NCB21HK-682X	CAPACITOR	0.0068μF,50V
		C6712	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C6713	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C6714	NCF21CZ-224X	CAPACITOR	0.22μF,16V
		C6717	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C6718	QEKJ1CM-336	E CAPACITOR	33μF,16V
		C6719	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C6720	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C6721	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6722	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C6723	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6727	NDC21HJ-470X	CAPACITOR	47pF,50V
		C6728	NDC21HJ-470X	CAPACITOR	47pF,50V
		C6729	NDC21HJ-8R0X	CAPACITOR	8pF,50V
		C6730	NDC21HJ-1R0X	CAPACITOR	1pF,50V
		L6701	QQL29BK-1R0Z	COIL	1μH
		L6702	QQL29BJ-3R3Z	COIL	3.3μH
		L6703	QQL231J-390Y	COIL	39μH
		L6704	QQL29BK-1R0Z	COIL	1μH
		L6705	QQL231J-100Y	COIL	10μH
		LC6701	QQR0657-013	NOISE FILTER	
		X6701	QAX0443-001	CRYSTAL RESONATOR	
		BK1	LP40077-001A	BRACKET(BOARD)	
		CN6701	QGG2502K1-11	HEADER PIN(1-11)	

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JOG SHUTTLE BOARD ASSEMBLY(J768EU) <37>

PW2	LPA10024-02A	JOG/SHUTTLE BOARD ASSY
UN7011	PEME0786-02	JOG SHUTTLE ASSY
CN7011	QGF1208F1-06	FPC CONNECTOR,(1-6)MAIN

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LOADING MOTOR BOARD ASSEMBLY <55>

PW2	LPA10010-01A2	LOADING MOTOR BOARD ASSY
CN1	QGB2533K1-02	CONNECTOR

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

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LED BOARD ASSEMBLY <90>

PW2	LPA10045-01A2	LED BOARD ASSY
D7033	SLR-342VR3F	LE DIODE
HD1	PQM30038-1-2	LED HOLDER,D7033
CN7005	QGB2530J1-03	CONNECTOR,(1-3)